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NEED FOR AND OPERATION OF A STRATEGIC DEFENSE INITIATIVE INSTITUTE

JOINT HEARING

BEFORE THE

SUBCOMMITTEE ON
OVERSIGHT OF GOVERNMENT MANAGEMENT

OF THE

COMMITTEE ON
GOVERNMENTAL AFFAIRS

AND THE

SUBCOMMITTEE ON STRATEGIC FORCES
AND NUCLEAR DETERRENCE

OF THE

COMMITTEE ON ARMED SERVICES
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NEED FOR AND OPERATION OF A STRATEGIC DEFENSE INITIATIVE INSTITUTE

WEDNESDAY, MAY 6, 1987

U.S. Senate,
Subcommittee on Oversight of Government Management,
Committee on Governmental Affairs,
and the
Subcommittee on Strategic Forces and Nuclear Deterrence,
Committee on Armed Services,
Washington, DC.

The subcommittees met, pursuant to notice, at 2:10 p.m. in room 342 of the Dirksen Senate Office Building, Hon. Carl Levin, chairman of the Subcommittee on Oversight of Government Management, and Hon. J. James Exon, chairman of the Subcommittee on Strategic Forces and Nuclear Deterrence, presiding.

Present: Senators Levin, Exon, Thurmond, Warner, and Bingaman.

Staff present: Oversight Subcommittee—Linda J. Gustitus, Staff Director and Chief Counsel; Elise J. Bean, Counsel; Richard Allen, Professional Staff Member; Frankie de Vergie, Chief Clerk. Strategic Forces Subcommittee—Carl M. Smith, Staff Director for the Minority; Professional Staff Members Robert G. Bell, Robert F. Bott, T. Kirk McConnell; Mickie J. Gordon, Staff Assistant; Jeffrey B. Subko, Assistant to Senator Exon; Edward M. McGaffigan, Assistant to Senator Bingaman; Donald A. Mitchell, Assistant to Senator Glenn; William J. Wight, Assistant to Senator Warner; Mark J. Albrecht, Assistant to Senator Wilson and James M. Bodner, Assistant to Senator Cohen.

OPENING STATEMENT OF SENATOR LEVIN

Senator **Levin**. The joint hearing of the Subcommittee on Oversight of Government Management of the Governmental Affairs Committee and the Subcommittee on Strategic Forces and Nuclear Deterrence of the Armed Services Committee will come to order.

We apologize for the delay. There was some question as to whether we might even be able to proceed this afternoon because there was an objection to the committees' meeting that apparently has just been cleared up a few moments ago.

We're here today to take a closer look at a proposal by the Defense Department to establish a new Federally-Funded Research and Development Center, or FFRDC, devoted solely to the Strategic Defense Initiative. This new FFRDC would be known as the Strategic Defense Initiative Institute, or SDII.

The Department of Defense says that it needs the SDII to provide it with technical advice on ongoing SDI research—to evaluate proposed SDI architectures, key technologies, and the optimum trade-offs among the technologies and research projects. I agree that DoD needs technical advice on these matters, but I'm not sure that the DoD needs a new institute to meet its needs. Existing research facilities and businesses with proven records of excellence can probably provide the desired advice at less cost to the American taxpayer.

The GAO surveyed 11 consultants "with broad governmental, military, industrial, and/or academic experience, but with no involvement with the SDI Institute proposal" and asked them to rank various options for SDIO technical assistance based on a number of factors. That study shows that while a new division of an existing FFRDC and a new FFRDC are both ranked first in terms of effectiveness, use of an existing FFRDC is ranked first based on cost. A new division within an existing FFRDC is ranked third on the basis of cost. A totally new FFRDC, as proposed by the DoD, for instance, is ranked sixth out of eight in terms of cost—far more expensive, in other words, than those other two options.

[The charts referred to follow:]

CHARTS FROM GAO REPORT ON SDII (NOVEMBER 1986)

Table II.3: Ranking According to Comparative Costs of Organizational Options

Ranking[a]	Organization	Total of individual rankings	Number of consultants who ranked organization[b] 1 or 2	Number of consultants who ranked organization[b] 7 or 8
1	Existing FFRDC/national laboratory	29	4	0
2	SDIO	33	4	2
3	New division in existing FFRDC/national laboratory	37	3	0
4	New DOD/service group	38	4	1
5	University	41	2	1
6	New FFRDC/national laboratory	50	1	3
7	Other non-profit group	51[c]	0	3
8	For-profit firm	67	1	7

[a] 1 is least costly; 8 is most costly.

[b] Some consultants did not rank the organizations while others gave the same rank to more than one organization.

[c] One consultant chose not to rank this organizational option because the consultant could not envision an organization that fit this category. If the consultant had assigned a score, this organization's minimum score would have been 52, and its maximum score would have been 59.

Table II.2: Ranking According to Comparative Effectiveness of Organizational Options

Ranking[a]	Organization	Total of individual rankings	Number of consultants who ranked organization[b] 1 or 2	Number of consultants who ranked organization[b] 7 or 8	Ranking by DOD
1	New FFRDC/national laboratory	26	7	0	1
1	New division in existing FFRDC/national laboratory	26	7	0	2
3	Existing FFRDC/national laboratory	39	3	0	3
4	Other non-profit group	37[c]	3	0	5
5	For-profit firm	52	2	3	6
6	University	62	0	3	4
7	SDIO	71	0	7	7
8	New DOD/service group	74	0	7	8

[a] 1 is most effective; 8 is least effective.

[b] Two consultants gave the same rank to several organizations.

[c] One consultant chose not to rank this organizational option because the consultant could not envision an organization that fit this category. If the consultant had assigned a score, this organization's minimum score would have been 38, and its maximum score would have been 45.

Senator LEVIN. I'd like to add here some information that is not in my prepared statement because it comes from materials that my staff received for the first time last night—specifically, a copy of the proposal that DoD has received from the persons it invited to run the SDII if it is created. We learned that these persons have proposed that the president of the SDII be paid an annual salary of $225,000. That's more than President Reagan receives. They also propose that the next tier of senior staff be paid an average of $110,000. Secretary of Defense Weinberger doesn't make that much. It's a lot of money.

Their own proposal notes that the proposed salary for the SDII president is higher than that received by any other FFRDC president, justifying it on the grounds of the importance of the work and the risky nature of the job.

Now DoD has not acted on this proposal and we'll try to find out today what their reactions are to it. But it raises serious questions, not only about the cost of the new SDII, but the process by which the DoD is pursuing its objectives, particularly since DoD has invited only this one group of individuals to submit a proposal and since some of these individuals were probably the very persons who encouraged DoD to establish an SDII in the first place.

And I might add that the proposal that the SDII president get $225,000 for administering an FFRDC with 300 to 400 people contrasts with the president of Los Alamos National Lab, for instance, who gets $131,500, and administers a laboratory with 8,000 employees.

Further, DoD's plans for establishing and managing the new SDII appear to undermine the independence of that institute, creating an appearance or the possibility of biased research, which would only hurt the SDI program.

Before I discuss the SDII proposal, let me just say a few words in general about FFRDCs.

When the DoD proposed to set up the SDII, it did not choose to create a new government lab or government agency. Instead, it chose to set up an FFRDC. FFRDCs are facilities run by private, nonprofit entities, usually universities or corporations specializing in research, even though the government funds 70 percent or more of their budgets. Examples are the Rand Corporation, Lincoln Lab, Los Alamos Lab and Lawrence Livermore Lab. The most prized attributes of an FFRDC are its outstanding staff and a reputation for providing objective advice—being willing to tell an agency the unvarnished truth about an issue, even if the agency doesn't want to hear it.

In light of their record of excellence, FFRDCs have gained special privileges in their conduct of government research. They have government sponsors, are exempt from civil service rules and are exempt from having to compete for the research projects that are assigned to them. I have begun to suspect that DoD wants an SDII to share in these privileges without also possessing the independence that enables an FFRDC to give advice which is objective, even if unpopular.

My suspicion arises, as I've said, from the DoD's plans for establishing and operating the SDII and also from DoD's stubborn resistance to inquiries and suggestions to enhance the independence of the SDII. Let me give you a few examples.

First, DoD has announced plans to participate in the selection of staff for the SDII. DoD has said that the SDIO would possess veto authority over the person proposed to be the SDII's president and would be able to require that other senior staff persons be "acceptable" to the SDIO Director. An excellent staff, insulated from political pressures, is at the heart of an independent research facility, and one of the quickest ways to weaken an FFRDC's independence—actual and perceived—is to allow its sponsor too much influence in its personnel decisions. Reports issued by the Congressional Research Service and the GAO advise against this level of participation in staff selection.

Second, DoD has indicated that it plans to issue the contract to manage the SDII on a sole source basis. The winner of this sole source procurement would almost certainly be the persons whom DoD has invited to run the project—persons whom DoD refused to identify, by the way, until a few days ago. DoD's plan for a sole source procurement runs counter to congressional efforts to open up government contracting to competition, in which the persons who offer the best proposal for the best price are selected to do the job. Competition was used in selecting contractors to manage the new Software Engineering Institute and the Center for Naval Analysis, two other DoD-sponsored FFRDCs, and I believe it should be used here as well.

In addition, DoD ought to subject the proposals it receives to review by science experts outside the government. Such peer review of the management proposals, especially if they are being evaluated on a sole source basis, would help insure the excellence and independence of the SDII. Peer review has been strongly advocated by the White House Science Council's Federal Laboratory Review Panel, headed by David Packard. It has also received support in the GAO report on the SDII proposal. And yet, DoD continues to resist this sensible suggestion.

Another concern centers on the DoD's decision not to guarantee any funds for independent research by SDII's staff, a decision which again undermines the independence of the research facility. The White House report I referred to states that "at least 5 percent and up to 10 percent of the annual funding of [a Federal laboratory] should be devoted to programs of independent research and development at the laboratory directors' discretion." The CRS and GAO reports also support some level of guaranteed funds for independent research. DoD nevertheless maintains a stance against this practice.

The sum total of DoD's plans for the SDII paint the picture of a research facility in which DoD would control the contractor, the staff and the work that the staff would be allowed to perform. An FFRDC subject to this degree of control by its sponsor would not be independent in fact or appearance and would be unable to provide truly objective advice in fact or appearance. Its lack of independence might also discourage top talent from applying for positions and cast a pall over any research performed by the center.

After supplying millions or perhaps hundreds of millions of dollars, we may be left with a weak but costly institute which tells the

SDIO what the SDIO wants to hear. It would provide only a scientific fig leaf. The taxpayers are entitled to more. And that's not what FFRDCs are all about. Such a biased institution would not only be a disservice to the SDI program, but reflect badly on the entire FFRDC community.

The GAO report on the SDII proposal states that various experts on defense policy and FFRDCs believe that a new FFRDC or a new division within an existing FFRDC could supply the DoD with the technical advice it needs concerning the ongoing SDI research. But in making their recommendations, these experts must have been envisioning a typical FFRDC—with a strong and independent voice—not the weakened facility which, due to the DoD's ground rules, would be subservient to its sponsor.

Today's hearing will explore whether a new FFRDC is actually needed or whether other alternatives to meet SDIO's needs for technical advice are preferable, such as continuing the use of existing FFRDCs or looking more at the private sector. We will also explore the DoD's rationale for proposing the type of SDII that it has said it wants. Finally, we will consider the costs of the various options.

As I indicated at the beginning of my remarks, we apologize for the delay, which was caused by the objection to committees' meeting this afternoon, which apparently was lodged and which had to be cleared up. I also indicated that this is a joint hearing between two subcommittees.

Now, let me call upon Senator Exon, who chairs the Subcommittee on Strategic Forces and Nuclear Deterrence, in the event that he has an opening statement.

OPENING STATEMENT OF SENATOR EXON

Senator Exon. Senator Levin, thank you very much. In last year's conference report, the Fiscal Year 1987 defense authorization bill delayed the SDI Institute funding until, A, the Secretary of Defense submitted a required report detailing the proposed operation of the institute and, B, Congress authorized funds for the institute in an act other than the appropriations act or continuing resolution. The conference report also asked the GAO for a report on this issue.

Over the last few months, these reports, as well as reports from other organizations, including the Congressional Research Service, have been provided to the Congress. The question, therefore, before the Congress now is whether the various concerns about SDII which were raised last year, including concerns as to its independence, objectivity and costs, have been answered or whether there are still valid reasons for delaying or deferring the SDII.

Today's hearing is going to be a great deal of help to us in trying to address this issue directly. And it affords an excellent opportunity for exploring other related issues.

I commend Senator Levin, who has taken the lead on this, and he's also an important and active member of our Strategic Subcommittee in Armed Services. I think this matter is primarily under the jurisdiction of the Government Affairs Committee. But, Senator Levin, we appreciate very much being called in to listen and join in this hearing because it has a great deal to do, of course, with the whole Strategic Defense Initiative which comes under the Strategic Subcommittee.

I also want to express my appreciation to Senator Warner, Ranking Minority Member of the Armed Services Committee, for withholding his amendment on this issue during our committee markup to afford us the opportunity to hold this hearing before the defense bill is taken up on the floor of the Senate.

I was a little late because I was on the floor of the Senate hoping that we could get approval to proceed with this and it did come just a few moments ago. It must have gotten here by telephone before I could arrive.

Senator LEVIN. It must have been due to your presence on the floor of the Senate. We weren't sure we were going to get approval and we all thank you for that.

Let me now call on Senator Thurmond, who is the Ranking Minority Member of the Strategic Subcommittee, for his opening statement.

OPENING STATEMENT OF SENATOR THURMOND

Senator THURMOND. Thank you, Mr. Chairman. This hearing represents the final step in the roadmap that we set forth last year to answer certain questions about establishing a new Federally-Funded Research and Development Center to support the Strategic Defense Initiative Office.

I congratulate you for an outstanding effort on very short notice in putting together this important hearing with such an impressive panel of witnesses, Mr. Chairman.

The issue in the Senate Armed Services Committee has not been whether the Strategic Defense Initiative has established a requirement for technical support, systems integration and program evaluation analysis. I believe there has been consensus from the beginning that a project with the breadth and complexity of the Strategic Defense Initiative requires such technical support as has been provided to other large projects.

At issue has been the appropriate means for providing such support, with the Administration recommending a new FFRDC.

Mr. Chairman, since the requirement for a Strategic Defense Initiative Institute first arose, there have been a number of studies and reports on the matter. Both the Department of Defense and the General Accounting Office have completed studies at the request of Congress that were entirely responsive to the concerns expressed by the Armed Services Committee.

In the course of these studies, recommendations have been made with respect to enhancing the independence and objectivity of the SDI, which have been embraced by the Department of Defense.

Mr. Chairman, I join you in welcoming our witnesses this afternoon. They represent a broad spectrum of experience in government, business and the scientific community, and I look forward to their testimony.

Thank you very much.

Senator LEVIN. Thank you very much, Senator Thurmond. Before we proceed, let me indicate that a chart which I made reference to in my opening statement and which is available out there has an error in it. It is the chart which looks at the cost of various options. We wrote in the word "most" and "least," and they're reversed.

We thought we'd help everybody interpret this chart and we ended up confusing everybody. The least expensive option, according to the GAO, is No. 1. The most expensive option is No. 8. And, again, we wrote in the words in exactly the reverse order. And that's the last time we try to clarify a GAO chart. [Laughter.]

Senator EXON. I would suggest, Mr. Chairman, if they haven't figured that out before you made the announcement, they aren't very well qualified to work on SDI, in any event. I expect that most of them had that figured out.

Senator LEVIN. As usual, Senator Exon tries to make me feel better when I make mistakes. We appreciate the effort. Thank you so much.

Let us first call on General O'Neill. General Malcolm O'Neill is the Deputy Director for Programs and Systems at the Strategic Defense Initiative Organization.

General O'Neill, we welcome you here and thank you for your testimony.

TESTIMONY OF BRIG. GEN. MALCOLM O'NEILL, DEPUTY DIRECTOR FOR PROGRAMS AND SYSTEMS, STRATEGIC DEFENSE INITIATIVE ORGANIZATION, DEPARTMENT OF DEFENSE

General O'NEILL. Well, thank you very much, sir.

First of all, I'd like to say that I have a written statement that I have submitted for the record.[1] I would like to add to that written statement some oral comments.

Senator LEVIN. That entire statement will be made a part of the record and if you're able to summarize it, we would appreciate it.

General O'NEILL. Yes, sir. I'll summarize it as part of my remarks, sir.

The issue of an FFRDC for the Strategic Defense Initiative Organization is one that is very timely at the moment. The program has proceeded for more than three years. The program has proceeded basically in a number of technical areas—the areas of sensors, the areas of battle management, command control and communications, and the areas of weapons technologies.

It is essential for the SDIO technical management to tie these disparate technical areas together. We have discerned in putting our program together and in executing our program that there is a technical inadequacy in the management of the pieces of the SDI program and there's also a technical inadequacy in providing the overall technical integration of the various elements of the SDI.

We feel that an FFRDC can provide the skills necessary to help the SDIO management tie together this very large program.

What I'd like to do is comment on some of the issues that have been raised with regard to the selection of a new FFRDC to support the SDIO.

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[1] See p. 49.

First, I'd like to echo Senator Thurmond's comments about the quality of the witnesses you've invited here today. I think you'll have an excellent cross-section of comments and opinions about the FFRDC in this case.

Second, on the issue of the requirement for the FFRDC. I think, from your opening remarks, I find it clear that you've acknowledged a need in the SDIO for support. I'd just like to clarify that a little bit. The centralized technical management of the SDI program is a significant task. It involves hundreds of researchers doing independent technical efforts. Those researchers typically work for agents like the U.S. Air Force, U.S. Army, Navy and other DoD agencies; and those agencies do their best to manage and execute the program under the direction from SDIO. However, they do not have the overview of the entire requirement for ballistic missile defense because, for one reason, we haven't resolved the issues of roles and missions between the services and the various agencies, so they are executing pieces.

As it were, they're building the tires. They're building the fenders on an automobile, but they're not quite sure what it looks like. It's the SDIO's responsibility to take those technical pieces and put them into something that resembles the ballistic missile defense approach. It has to start immediately. It starts the day you write down the first theoretical equation to develop a solution to the ballistic missile defense problem.

At present, the SDIO has an exceedingly capable staff. But it does not have the numbers or technical strength required to optimally integrate the research effort of its hundreds of performers into a fully harmonized effort. That led to our search for a support organization that could do this.

Next, on the selection of an FFRDC versus another type of performer. This search included a study by SDIO. It included a study by the DoD. It included analyses by the GAO and the Congressional Research Service.

The DoD conducted a study, and I'll speak to that study because I know that you have witnesses from some of the other organizations. The DoD conducted a study of the options for obtaining the support that we talked about and found that an FFRDC would promote the desired talents. It would provide those talents to the SDIO. Those people would be free of the conflicts of interest that would be inherent in either established FFRDCs that are supporting a different mission or the contractors who would be in fact supporting other contractors who are participating in the SDI.

We felt that an FFRDC would have significant independence. It would have significantly more independence than a private contractor, which would have to compete on an annual basis to be awarded an effort from the SDIO. One of the advantages of an FFRDC is that it can, because it has a commitment from the DoD over a long term, remain to a certain extent aloof from the direct control of the sponsoring agency. That's in favor of the new FFRDC.

Independent studies by the other organizations—we've read the GAO report, we've read the CRS report—appear to us to validate the study that we conducted.

On the means of selecting the contractor proposal for the FFRDC—you commented on that also—the SDIO has completely followed the Office of Federal Procurement Policy guidelines and when we solicited the FFRDC, we announced our intention to establish such an organization through several announcements in the Commerce Business Daily over a 90-day period, and several announcements in the Federal Register.

In parallel with our announcement, the Secretary of Defense did, within his legally ascribed responsibilities, encourage individuals who are prominent in the field of national security, to form an organization that could be responsive to the solicitation by the SDIO.

After this 90-day period, we received a single proposal to operate the FFRDC. The proposal was evaluated and has been determined to be sufficiently responsive for us to consider future contract negotiations. Of course, the proposal is not the contract and what a contractor puts in his proposal is not necessarily what the government buys. You can buy a part of what he offers. You can buy all of what he offers. And that is the purpose of negotiations. We undertake contract negotiations with FFRDCs, with private contractors, and the like.

Of course, no financial commitments have been or will be made by the DoD until authorizing legislation is obtained from you.

Finally, on the issue of independence of the FFRDC. SDIO agrees that independence is essential and that optimal value will be obtained from the SDII if it can put forth its unvarnished opinions of the research that is taking place in the program. That's the purpose of having the FFRDC.

Like the other FFRDCs, and our FFRDC will be like the others, we will make a long-term commitment to the support of the organization, typically a five-year commitment. They're immediately more remote than an annual contracting entity would be, more independent than a private contractor would be. SDIO will, contrary to what was said earlier, allow a discretionary budget element for spending by the FFRDC on those independent efforts of its own choosing.

SDIO will not recruit and SDIO—DoD, excuse me—will not hire the FFRDC staff. General Abrahamson will exercise approval authority over selection of the president of the FFRDC before he commits the government to a five-year commitment and a very strong relationship between this organization and the Federal Government. He feels that is contingent in his responsibilities to the President of the United States, as the person in charge of the SDI program.

We expect the president of the federally-funded research and development center to have full authority to choose and hire all of his FFRDC personnel.

Sir, this completes my prepared comments. If you have any questions, I'm at your disposal.

Senator LEVIN. Thank you very much, General. What we'll do is we'll follow a 10-minute rule here.

In your report to the Congress in April, you said that the technical directorates of the SDII would have to be acceptable to the SDIO director.

General O'NEILL. Sir, that wording is incorrect.

Senator Levin. That was your own report.

General O'Neill. That wording is not in effect the way we are handling the SDIO FFRDC. It may have been a——

Senator Levin. When did it come out?

General O'Neill. When did it——

Senator Levin. When did this change in policy come about because we've been working very——

General O'Neill. Last summer, sir. Last summer. It was changed based upon the comments of the first congressional staffers that we talked to. We followed up with elements of the DoD and talked to, for example, the Navy, which runs the Center for Naval Analysis, where the Secretary of the Navy approves the selection of the president of the CNA. We found that it was not appropriate to approve any other personnel but the president of the FFRDC. And that is the SDIO position. That's the position we took in discussions—if you refer to the GAO report, it comments to that effect in the GAO report.

It does say in the GAO report that the SDIO had wanted to approve the technical director level positions, but changed its mind. And that GAO report—I don't know the date of it, but it was——

Senator Levin. Well, I'm not looking at the GAO report. I'm looking at your report, dated April of 1987. That's just last month. And here's what you say in last month's report, which is a long time after last summer.

General O'Neill. Yes, sir.

Senator Levin. It says, "The sponsoring agreement will require only that the institute's president and the heads of its several technical directorates be acceptable to the SDIO director."

General O'Neill. That's incorrect, sir. That is an error in the report, sir. That's incorrect.

Senator Levin. Well, our staffs have been working pretty closely on this issue and no one ever told us about this change. I'm kind of surprised, given the emphasis that we've put on independence. This change came out last summer?

What I'd like you to do for the record, if you would, General——

General O'Neill. Yes, sir.

Senator Levin [continuing]. Is to show us where this change was made last summer.

General O'Neill. Yes, sir. I can show you in the GAO report, sir.

Senator Levin. You can give us the documentation for that because your report last month continues to have the old policy in there, and given the emphasis we put on independence, I'm frankly kind of amazed.

General O'Neill. Yes, sir. I apologize for that report, sir. It is incorrect.

Senator Levin. In terms of the amount of guaranteed funds for independent research, you're saying now that you are willing to guarantee some funds for independent research.

General O'Neill. Yes, sir.

Senator Levin. The White House Science Council's Federal Laboratory Review Panel, in 1983, which was reporting on federal labs in general, says that at least 5 percent and up to 10 percent of the annual funding of the federal laboratories should be devoted to programs of independent research.

Are you going to meet that guideline?

General O'NEILL. Yes, sir.

Senator LEVIN. Well, again, looking at your April report, you said the SDIO cannot commit to any fixed portion of the SDII's budget.

General O'NEILL. Yes, sir. The wording of that statement may be incorrect. What we meant was we are not going to say what that percentage is right now.

Senator LEVIN. But I just asked you whether you could commit to the 5 to 10 percent guideline and you said you would.

General O'NEILL. Yes, sir. That's not a single number. The issue is—when we negotiate with the contractor, we do not want to tell the contractor what that number is. We want to find out what he feels he can accommodate with the personnel and the talents he's going to bring aboard and then we will negotiate a figure within that guideline.

And I think it would be our position to try to find something in between. I don't know whether it would be 5, 10, 7, 6, or otherwise.

Senator LEVIN. Your testimony today, it seems to me, also conflicts with your April report.

Is that true, in this regard, that the April report's in error, then?

General O'NEILL. No, sir. I think the wording of that April report is misleading. But I think——

Senator LEVIN. Well, that's the same thing. So your April report's misleading in this regard as well, then.

General O'NEILL. As you interpret it, yes, sir.

Senator LEVIN. Well, how about as you interpret it?

General O'NEILL. No, sir. If you read it as saying we will not determine a fixed amount, we have not decided on a fixed amount for independent research, and read that sentence that way, I think that explains it. There's no fixed amount, no commitment to a fixed amount that has yet been decided on.

Senator LEVIN. But your April report said that you would not agree to a fixed amount, didn't it?

General O'NEILL. That is wrong if that's what it says. I don't have the report in front of me, sir.

Senator LEVIN. All right. Well, we'll make that part of the record, too, because I think that's the only way to read it.

General O'NEILL. Yes, sir.

Senator LEVIN. How about peer review? Here you've got a contract which is not competed—and by the way, you're not suggesting that you solicited proposals, are you?

General O'NEILL. No, sir.

Senator LEVIN. Okay. So this is a sole source contract?

General O'NEILL. Yes, sir.

Senator LEVIN. Because in your testimony, I thought you suggested that you only received one proposal during the 90-day period following the notice that you were going to enter into a contract. It was not a solicitation for proposals that was published, correct?

General O'NEILL. It was not a solicitation for proposals, yes, sir.

Senator LEVIN. Now, we've got a sole source contract. Particularly because of that, it's important that there be peer review of your proposal. The GAO report, for instance, indicates that 9 out of the 11 consultants interviewed "said that some kind of peer review of the proposal is necessary to best guarantee the independence and objectivity of the institute." But you apparently are not going to provide for peer review.

Can you tell us why not?

General O'NEILL. Sir, it is the opinion of the SDIO and the DoD that the SDIO, for whom the contractor will be working, is the best peer group, the best group to evaluate its proposal. For the same reason that you don't ask another agency to evaluate a proposal for work that you want to have done, we see no reason to establish a peer group to evaluate the proposal from this FFRDC.

It would be very difficult to establish a group that has the knowledge base and the understanding of the requirements for ballistic missile defense that the SDIO has and has acquired over the last three to four years.

Senator LEVIN. This is a process question that we're talking about, peer review of a proposal. We're not talking about peer review of the substance of whether or not a certain battle management plan works. We're talking about the peer review of a proposal to create an institute which is supposed to be scientific and objective. It's that proposal we're talking about—who picks the staff, who controls the staff, how much independent research there is going to be and those kinds of issues.

As I understand it, you have refused the suggestion, even though 9 out of the 11 people interviewed by the GAO recommended that there be outside peer review of the proposal.

General O'NEILL. We respectfully disagree with that finding of those experts, yes, sir.

Senator LEVIN. The GAO report rates a new division within an existing FFRDC as equally effective to creating an entirely new FFRDC and rates it as a less expensive option, particularly because of the savings in start-up costs.

Can you tell us why it is that you have not decided to look at an existing FFRDC at least as a possibility? For instance, to solicit a proposal from an FFRDC that already exists with the possibility of its setting up a new division.

General O'NEILL. Yes, sir. In our study of alternatives prior to deciding upon a new FFRDC, we did look at the option of using an existing FFRDC. It turned out that what we needed was expertise that did not exist in any of the FFRDCs. So that, in any case, there would have to be hiring. There would have to be expansion of the organization.

Senator LEVIN. That's true with the new FFRDC, too, isn't it?

General O'NEILL. Yes, sir. But in that sense, they're both the same. There are several issues with regard to an existing FFRDC.

First, the existing FFRDCs were not co-located with the SDIO. So the existing FFRDCs would have to be moved or their elements would have to be relocated to the Washington area.

The existing FFRDCs presently work for sponsors. The sponsor of the two FFRDCs that we thought were most closely related to an SDIO function—namely, the Mitre Corporation in Boston and the Aerospace Corporation in Los Angeles—is the U.S. Air Force.

It wasn't clear to us that there wasn't a direct conflict in the FFRDC between their goals and responsibilities in support of the United States Air Force and the goals and responsibilities of that organization for the SDIO. It was not felt that the mission of ballistic missile defense in an organization like Aerospace would have a significant amount of priority if, in fact, the Aerospace Corporation, which is several thousand employees, was provided with a 300-man add-on cell.

We felt that the unity of purpose that one would obtain in a new FFRDC, albeit, small, would be sufficient to justify a new FFRDC. And there would be no conflicts between the requirements of the United States Air Force and the requirements of the President's SDIO program.

Senator LEVIN. Thank you, General. My 10 minutes is up.

Senator Thurmond?

Senator THURMOND. Thank you very much, Mr. Chairman.

General O'Neill, the SDIO has undertaken architectural studies and has considered phased deployment options. These efforts would seem to require the kind of technical and analytical support that would be provided by the SDI Institute.

How has the SDI supported these efforts without a dedicated support organization?

General O'NEILL. Sir, what the SDIO has done in the past is, it has assembled ad hoc groups from the agents. It has assembled groups of professional service corporation members. And it has itself, myself and General Abrahamson and others, coordinated and managed the day-to-day analysis and activities to assess the relevance of these architectural alternatives and all the operations research and systems analysis that we do.

What we need is someone who has technical preeminence, who can look at the systems studies that we're doing, to answer your question, and act as a devil's advocate, act as another mind and another set of eyes looking at those ideas, who can come to us and tell us whether they were good, bad or indifferent.

We need, as it were, a Howard Cossell for the SDI.

Senator LEVIN. I think you just lost your institute. [Laughter.]

Excuse the interruption, General O'Neill.

Senator THURMOND. General O'Neill, the General Accounting Office study suggested several changes to DoD recommendations, that, in the opinion of the GAO consultants, would enhance the objectivity and independence.

Has the department adopted all the recommendations in the GAO study?

General O'NEILL. Sir, we have adopted most, but not all, of the recommendations in the GAO study. Senator Levin brought up the issue of peer review of the proposal. We did not adopt that finding in the GAO study.

Senator THURMOND. General O'Neill, what is the current status of the SDII planning activities within the DoD? If the Congress authorizes funding for this purpose, what lead time would be required to get a new FFRDC up and operating?

General O'NEILL. Sir, we have, based upon the receipt of the proposal, we have determined within the SDIO what an appropriate scope of work to ask the FFRDC to undertake would be. The scope of work is not what's in the proposal. It's something different.

The SDIO has met in ad hoc committee and determined its priorities for work, what we need to have done first, second, third, et cetera. It has allocated resources that we think are reasonable for an FFRDC. And I would suggest that we're in a position to enter into negotiations in a very short time upon receipt of authorization from the Congress.

I would think that we could begin negotiations within a few weeks. Unfortunately, when you negotiate with a contractor, it's a two-way street to get under contract. The negotiations could take a few weeks; they could take a few months.

I would hope the negotiations would be constructive and that we could be under contract before the end of the fiscal year. And for that reason, we have started to identify those resources that we might be able to tap to provide support for the initial start-up of an FFRDC in fiscal year 1987.

Senator THURMOND. General O'Neill, no funding is identified in the Fiscal Year 1988 budget request for the SDII. How much funding would be required for the establishment and operation of an SDII and what will be the source of that funding?

General O'NEILL. Sir, the funding would be provided from a portion of the five program elements that make up the SDI budget. We've estimated that approximately $35 million would be budgeted for the FFRDC. That money would include the start-up costs, the capitalization required, and some initial operation with a limited staff.

Senator THURMOND. Thank you very much. That's all, Mr. Chairman.

Senator LEVIN. Thank you, Senator.

Senator Exon?

Senator EXON. General O'Neill, the recent SDIO report to the Congress on the SDI program contains an appendix on SDI Institute. One sentence of that appendix reads as follows: "The sponsoring agreement will require only that the institute's president and the heads of its several technical directorates be acceptable to SDIO."

Two sentences later, it reads: "The SDIO will not have veto power over the FFRDC's staff selection, except for that of the president."

Now can you explain what appears to be a basic inconsistency between these two sentences?

General O'NEILL. Yes, sir.

Senator EXON. In other words, isn't saying that someone must be acceptable to SDIO the same as saying that SDIO has veto power over that person's selection?

General O'NEILL. Sir, the latter statement is the operative statement. The important thing is the concurrence that's needed to select the president of the FFRDC from General Abrahamson. A concurrence is not required to select any other person who works for the SDI Institute.

I think the word "acceptable" is wrong, poorly chosen. I apologize for it.

Senator EXON. All right.

General O'NEILL. And it should be, for the record, stricken from the record. By acceptable, what the author meant, and I'm as responsible as the author is for that word, what he meant was there would be consideration to the SDIO personnel who are experts in their areas of their understanding of the field when the FFRDC selected a person who was going to be the technical director in that area. But the president of the FFRDC will make the decision, has the power to make the decision who his technical directors will be, and we do not.

What we were trying to say is there's going to be a positive relationship of long standing between us and our FFRDC, and that if I am an expert in golf clubs and they're trying to find a person who is the world's foremost golf club expert, I should be able to provide some input. And that's all that is supposed to say. It very clearly misses the mark and I apologize.

Senator EXON. I think that's understandable and I appreciate your forthright answer to my question.

Why do you propose to fund the institute out of SDI funds? It seems to me that what you want to do is centralize control, even with regard to funding.

General O'NEILL. Sir, my perception is that the SDI FFRDC would have no other likely source of funding than the SDIO. I can't imagine that there would be a patron in the Defense Department who would support this organization, unless the organization supported them. If it was the Army, it would support the Army. If it was the Air Force, it would support the Air Force, or it would support the Air Force part of the SDI program.

Right now, the Aerospace Corporation supports the Air Force part of the SDI program and does it very well. It just doesn't support the whole program. It supports a part of the program.

So we budget that element of the SDIO, the FFRDC, that would support SDIO.

Senator EXON. If the Congress felt it was a good idea, would you object to Congress establishing a specific line item for SDI Institute and a separate one for SDI funds, so that we could separate the two?

General O'NEILL. Sir, I have no expertise to that degree to argue one way or the other. The idea is to authorize the formation of an FFRDC, and I think if the Congress felt in its wisdom that it should be a separate program element, I would defer to your judgment, sir.

Senator EXON. General, I think you tell that the line of questioning here has focused on objectivity all the way along the line.

As you know, the President has directed that SDI is not to be deployed unless it can meet the so-called "Nitze" criteria, which, of course, means that SDI must be cost effectiveness at the margin and survivability.

In your opinion, would SDII be sufficiently independent and objective so that it could conceivably dissent from a determination by SDIO that a proposed system could indeed satisfy these conditions?

Once again, I'm back to my central theme, which is are we going to have enough differences of opinion to make sure that we don't straight-jacket not only the thinking, but also on some of the experimentation and research?

General O'NEILL. Sir, I don't think there's any problem finding differences of opinion, in the SDI program, outside the SDI program, between contractors in the SDI program and between us and our FFRDC's.

We don't have a ray gun that we fire at anybody who disagrees with us. I'm sure you hear people who disagree with the SDI every day. Some of our contractors whom we fund and continue to fund disagree with us because we respect their intelligence and we respect the positions from whence they come.

In many cases, we would be in an adversarial mode with people who disagree with us. But I think the idea that there could be no dissent is—I hate to say ludicrous, but I wouldn't worry about that, sir. As long as we're American citizens, there will be dissent and there will be the right of dissent, and that's the way it is.

Senator **Exon**. I have one last question. I haven't made up my mind completely on SDII. Don't take it from my line of questioning that I'm necessarily against it because I'm not.

I once again return to the theme of my line of questioning, and that is do you think there would be much dissent, as much differences of opinion within the SDII to allow objectivity? And would that dissent and differences of opinion reach the public as much as it does as of now, if we created this institute and the management technique that evidently is envisioned to be connected with it?

General **O'Neill**. Yes, sir. I think there would be more—I think there would be a better understanding of the SDI. There would be a better debate, a more enlightened debate.

The professional scientists who would make up the SDI Institute are the quality of individual who are not staking their life on the SDII. They can go out tomorrow and find another job. We can't bully them. If they come up with a logical, educated decision that such and such isn't going to work, they're going to say it, just as my majors and colonels and lieutenants say it to me every day.

That's the way we do business.

All I can is I think you'll know more because you'll have a more enlightened management of the program. There will be less obfuscation. There will be more pith, more marrow to the program.

Senator **Exon**. Thank you, General. My time is up, Mr. Chairman. Thank you.

Senator **Levin**. Thank you very much, Senator Exon.

Senator Warner?

Senator **Warner**. Mr. Chairman, I thank you, and I express my appreciation to you and the distinguished Ranking Member here for holding these hearings. We've been on this issue a long time. We started on it, what, I think about three years ago.

Senator **Levin**. It seems that long. [Laughter.]

Senator **Warner**. Anyway, my question, General, is along the following lines. Let's face it. You've got yourself in a turf war with this proposal. There are a lot of fine companies out there in the private sector who are looking at this thing as a tremendous threat to what they rightfully perceive, I hope, with the next president strongly supporting SDI, a long and important program, well funded.

Now, how can we try and assuage some of these concerns and start by saying if the SDII clearance came from Congress tomorrow, what percentage of the work that you're contracting out now would be brought back in-house?

General O'NEILL. Sir, the estimate that I gave Senator Thurmond was $35 million in 1988, which represents less than one percent, hopefully less than one percent of our budget that would be going into the SDI Institute.

Senator WARNER. Are you saying the budget mark——

General O'NEILL. Sir, we would have to reallocate resources.

Senator WARNER. Go ahead.

General O'NEILL. I'm not sure what the budget is going to be.

Senator WARNER. I think you'd better drop that.

General O'NEILL. Yes, sir. [Laughter.]

But what I have said to the representatives of the professional services companies who support us very ably right now is that the FFRDC is not a threat, unless you have very global, very ambitious plans about taking over a single role as the major guru of the SDI.

The SDI Institute, the FFRDC, will be an augmentation to the high-level technical managerial staff of the SDIO.

Senator WARNER. It would also run across-the-board sort of survey.

General O'NEILL. Yes, sir.

Senator WARNER. Whereas, the private sector would still have the ad hoc, piecemeal, fragmented role?

General O'NEILL. Exactly. It will not replace the existing, very talented, very capable professional service company participants.

Senator WARNER. So, therefore, you don't think it would be a competitive pull.

General O'NEILL. No, sir, unless they had plans for significant growth into a new area.

Senator WARNER. As I look over this GAO report and the testimony in the hearing today, the peer review issue is probably the central division point. I wonder if I can clarify it.

Is it your concern that the peer review will continue on and be on a continuing basis, or is it going to be used at the outsets, as you establish it, and then step aside?

General O'NEILL. Sir, the issue of peer review, as it was brought up in the GAO report, was specific in that they thought that peer review was necessary of the proposal. This organization coming into SDIO and saying, we would like to do this for you, they thought it would be a good idea for us to say, okay, fine, now we'll give this to some company or some group of individuals and let them see if that is what SDIO wants.

It doesn't make a lot of sense to me, so it's very difficult for me to explain to you why anybody would want to do that, what the positive benefit of establishing a peer group to see whether the proposal that was submitted by a company to us to do work for us was what we wanted them to do.

I'm sure General Abrahamson would be willing to add additional insights if this issue was not resolved by my comments.

Senator WARNER. Are you dug in on the issue of the peer group or, are you prepared to march off and let the peer group come in, get it done, set up and go to business?

General O'NEILL. Sir, I think the important thing is getting the work done. We're not dug in on any issue that has been raised by the Congress or by GAO.

Senator WARNER. So a peer review of the initial establishment of it you'll buy off on.

General O'NEILL. Certainly.

Senator WARNER. And it won't be necessary to have it on an ongoing, continuous basis.

General O'NEILL. No, sir.

Senator WARNER. I got here late and I'm sorry. I thought the hearing was off and then we got it back on again.

Is there any need in your testimony to go further go into the subject of a concern that you may or may not have about the private sector being unable to provide you objective advice without any conflict of interest? Have you covered that here today? If you have, I don't need to go over it again.

General O'NEILL. Sir, I've covered that point.

Senator WARNER. All right.

General O'NEILL. I just want to make one positive comment about the private sector. It's not that we've concerned in every area about conflict of interest. But a private company has some built-in conflicts when it is a subcontractor to a company that is working for SDI and at the same time trying to give impartial advice to SDI.

It's a conflict which we understand and that's one of the reasons we picked an FFRDC.

Senator WARNER. Thank you, Mr. Chairman.

Senator LEVIN. Thank you, Senator Warner, for your deep involvement and interest in this issue.

Senator WARNER. Can we make a part of the record our discussions at the last conference of the House and the Senate?

Senator LEVIN. If you could tell me what that was first, I could give you the answer. I forgot what it was.

Senator EXON. It would be best to keep that secret, I'd think.

Senator LEVIN. We'll go into executive session for that, I think.

Senator Bingaman?

Senator BINGAMAN. Thank you, Mr. Chairman. This might have been asked while I was out of the room, but if it was, just indicate so.

Why can't some of your need for top-quality personnel to do this research be accomplished by inter-governmental personnel agreements? Gerry Yonas, for example, was a fairly key player in SDIO on the basis of one of these intergovernmental personnel agreements. Why can't your need for technical expertise in-house be met with that kind of arrangement?

General O'NEILL. Sir, that was one of the alteratives we looked at. It is a very time-consuming, people-intensive, manpower-intensive effort to get what we call IPA's in. A person like Gerry Yonas is a significant help to the program. But, again, he is fully integrated into the program. He is not capable of establishing his own little cell and running off and doing something separate.

So we do have IPA personnel in SDI. And I think the number would approach five, maybe seven. But when you're talking about the kind of commitment that we want to try to get from our supporting organization, it's in the hundreds. We want 100 to 200 to 300 fully qualified technical people. Those people are just not available through the IPA channels.

You have to remember that every IPA person who comes carries away that job, as it were, from his parent organization. Gerry Yonas came from Sandia Corporation. So Sandia had to be prepared to move people up to take the position that Gerry vacated temporarily, and then they had to be prepared if Gerry wanted to exercise his rights to come back to his company to take all those people and say, okay, now you go away and go back to your old jobs.

So it's kind of a destabilizing thing, both for us and for industry. We thought that the FFRDC was a better option, sir.

Senator BINGAMAN. If you look at another potential occurrence, if you set up this SDII, under which you could pay significantly better salaries than you're able to pay to people working in the SDIO, what would keep some of your best people from leaving SDIO and going to work for SDII in order to get the better benefits and better salary and continue to pursue basically the same work?

General O'NEILL. That issue is a tough one, sir. I can't answer the question right now.

Senator BINGAMAN. You say there's really no reason why they would not quit SDIO and go to work for SDII?

General O'NEILL. No, there's a very important reason and it's the reason that they're probably working for the government right now. And that is, you don't make a lot of money in the government, but the buck usually stops at your desk. You make the decisions. There are people in this country who would rather be the one in charge than the one taking home the fattest paycheck.

I think the motivation that I find in the technical people in the SDIO right now is the motivation that says, they can't pay me enough to leave. I want to work here. I want to contribute.

Senator BINGAMAN. But with the kind of close relationship you're talking about between these two organizations, a person could pretty well argue that they didn't leave their important work by just moving over to the institute and continuing to spend full-time doing the same basic mission that they've been doing all along.

General O'NEILL. If the mission is the same, yes, sir, you're absolutely right. I think what you find, however, is that when you are, and I haven't been one, but I think the perception is when you are in an FFRDC, you're still outside of that decision-making cell and you still are an advisor, a consultant, a devil's advocate, a person who can have an opinion, but when the rubber hits the road, it is that government guy over there who's going to make the decision.

And that's where the person—and that's why I had difficulty answering your question, sir—the person has to make that judgment for himself.

Senator BINGAMAN. Let me just ask also about the independence issue. I have great difficulty making the leap to assume that you'd have these very close working organizations, closely integrated organizations, and not have a tremendous pressure on anyone in a significant position in the institute, to essentially become an advocate for the SDIO.

I come from a legal background and our job in the law business is to advocate. But I see a lot of that in nonlawyers as well. I have great difficulty seeing how anything but advocacy would result in this instance. You say there's a lot of disagreements and you wouldn't squelch those disagreements.

What about the head of the SDIO saying, look, we can get a lot of disagreements without hiring people to disagree with us. Why should we hire key people in the institute who are going to be in there arguing the other side of this issue? We need some allies in this game as well.

It seems to me that's a very natural course for the head of the SDIO to take.

General O'NEILL. Well, I think the natural course for those people who would come to work at this FFRDC would be to try to make the research successful. The idea is to do the necessary research to determine whether ballistic missile defense is feasible.

So we're trying to find solutions to the problems, not nonsolutions to the problems. What I meant by dissent was disagreement in whether we had solved a particular problem, disagreement on how to solve the problem.

But if the person was hired by the FFRDC to find out why we shouldn't defend ourselves from ballistic missiles, and to try to find all the ways that technologies won't work, that is not what I would think the person's goal would be, or the motivation of SDI in contracting with that particular individual.

Senator BINGAMAN. I can agree that you wouldn't hire a person with the explicit purpose of finding reasons why it wouldn't work. But suppose a competent scientist in a key position in the institute concludes that a particular course you're pursuing just is not technically feasible, it's not going to work, and wants to state that position publicly.

Are you suggesting to me that they would be free to state that position, even though it's contrary to the position being argued by the Administration, being argued by the head of the SDIO?

General O'NEILL. Sir, I don't know how the head of the SDI could prevent someone from saying what he wanted to say.

Senator BINGAMAN. Well, he could certainly demote——

General O'NEILL. No, he couldn't. The head of the SDIO could not demote anybody in the FFRDC.

Senator BINGAMAN. Well, he could certainly cut off the money for the FFRDC.

General O'NEILL. After a certain number of years, yes, sir.

Senator BINGAMAN. After one year. Around here, we can't control what any executive agency says, but we can sure zero their budget if people get upset enough with them.

General O'NEILL. Yes, sir. The commitment of the SDIO to the FFRDC is normally five years. If the circumstance is, I'm sure, special, we could probably terminate that relationship after a year. You're right.

But I don't think we would do that if one scientist in the FFRDC disagrees with the rest of the scientists in the FFRDC. It happens every day.

Senator BINGAMAN. No. I'm just suggesting there would be fairly strong peer pressure on the disagreeing scientist to shape up his act and start getting in line with the Administration.

General O'NEILL. Yes, sir. Peer pressure is something that is always strong and depending upon what organization you're in, it pushes in a way that the majority or the stronger individuals in the organization push.

If you are convinced in your conviction that you're right and they don't know as well as you this particular technical area, you're supposed to persist.

We want to find out, just as well as you want to find out, whether this thing is going to work.

Senator BINGAMAN. That's all I have, Mr. Chairman.

Senator LEVIN. Thank you, Senator Bingaman.

We've been trying to find out for quite some time who the members of the board of trustees of the SDII is. Until a few days ago, we couldn't get that list.

Why was that list withheld from us? Do you know?

General O'NEILL. Sir, I can't answer that question. I don't know why.

Senator LEVIN. All right. You weren't involved in that decision to keep that list from us?

General O'NEILL. No, sir.

Senator LEVIN. Now when we look down that list—we just got it a couple of days ago—we see that at least some of the members of that SDII, as proposed, are also members of the SDI Advisory Committee.

Is that true?

General O'NEILL. Yes, sir.

Senator LEVIN. So you've got the Advisory Committee for the SDIO presumably advising to create an SDII—I presume they were part of the decision to go this way—is that true, first of all?

General O'NEILL. The advisory board thought it was a good idea, yes, sir.

Senator LEVIN. Okay. So the Advisory Committee for the SDIO is recommending that you get an SDII in existence. Then some members of your Advisory Committee end up on the SDII board of trustees. They set proposed salaries for the officers of the SDII, the full-time people. And now I take it, it's possible that some of the SDII board of trustees might also end up as officers.

Is that not possible, too?

General O'NEILL. I'm not sure, sir. I'm not sure whether they would be officers or not, sir. I don't know.

Senator LEVIN. Well, take an example. Could General Shriver be president of the SDII, for instance?

General O'NEILL. I'm not sure. I don't know.

No, he cannot.

Senator LEVIN. Is that in the SDII by-laws—that none of the members of the board of trustees could end up being officers?

General O'NEILL. May I check on that, sir?

Senator LEVIN. Sure. The by-laws say they can be officers.

General O'NEILL. They cannot.

Senator LEVIN. The by-laws say they can be. Do we have them? At least that's what my intrepid staff tells me.

General O'NEILL. Sir, we'd like to answer that question for the record.

Senator LEVIN. While we're looking for the answer, can you explain—you haven't approved yet this proposal with these salaries, have you?

General O'Neill. No, sir.

Senator Levin. Do you have a reaction to them—the proposal that the SDII president get $225,000 with 400 employees under his administration when the Los Alamos president gets $131,000 with 8000 employees and the Livermore President gets $137,000 with 8000 employees. The folks who are submitting this sole source proposal, I emphasize, are proposing that their president get $225,000.

Do you have a reaction to that?

General O'Neill. I would think, sir, that our negotiating position for those salaries will be based upon like salaries in similar organizations.

Senator Levin. Is there a similar organization?

General O'Neill. Well, the ones that you just mentioned are like salaries.

Senator Levin. You would assume then that you wouldn't approve anything above that range of $130,000?

General O'Neill. Sir, I won't be the negotiator, but I think the negotiating position will be to go with like salaries in like organizations, yes, sir.

Senator Levin. This proposal comes from folks who are on your board. You've got one board over here advising the SDIO. That's called the SDI Advisory Committee. Then you've got the SDII board of trustees. Some of these folks are the same folks. I mean, it's a bit incestuous here to begin with. It's like—I've heard of Tinkers to Evers to Chance, but this is like Tinkers to Tinkers to Tinkers. [Laughter.]

The proposal comes from people who, at least in part, are on the Advisory Committee for the SDIO. So are these people now going to be giving recommendations to the SDIO on their own proposal?

General O'Neill. Sir, in my understanding, they will not give advice on matters that they are involved in.

Senator Levin. But they did recommend that this institute be created?

General O'Neill. My understanding, yes, sir.

Senator Levin. And they are, then, on the board of trustees, also, some of them, of the very institute that they recommended be created?

General O'Neill. Yes, sir.

Senator Levin. And as to whether or not they can also serve as officers under the by-laws, we'll check the by-laws. We'll double-check that.

Senator Warner. Mr. Chairman, perhaps he could give us some insight on whether or not the Congress should write in some caps on these salaries—not higher than, for example the two laboratories.

General O'Neill. Sir, I'm interested in getting the effort started. I would like the government to have maneuver room. There are people in the United States who could command salaries of that level. I think if we obtained one of them, it would be worth it.

Senator Warner. Yes. But he sort of fits the profile of that individual you said sits there at his government desk saying, I'm making decisions and I'm willing to take a 50 percent pay cut to make those decisions. This guy would be in the decision place.

General O'NEILL. Sir, if we want independence and if we want some hard minds, some tough guys running the FFRDC and executing the tasks in support of SDI, I think we should look first to the talent and find out what he's making at wherever he is working.

And if you think, and I'm saying you, General Abrahamson, or the board of trustees of the SDI Institute, if you, board of trustees, think that it's worth it to invest another $100,000 to get John Doe, and you look at the scope and breadth and cost of research in SDI, I'd pay $100,000 and not blink an eye if I could get that man.

Senator LEVIN. You would add "or woman," too, I'm sure.

General O'NEILL. Or woman, yes, sir. [Laughter.]

Senator LEVIN. I would just remind you that the heads of Los Alamos and Livermore, with 20 times as many employees and pretty heavy responsibilities, get $131,000 and $137,000, respectively.

General O'NEILL. Yes, sir.

Senator LEVIN. I think their responsibility is very heavy, indeed, and you're way out of line, as far as I'm concerned—just way out of line.

Would you have any problem with a prohibition, assuming we created an SDII and approved it, with a prohibition on any people currently serving in the SDIO or contractors switching over to the SDII staff?

General O'NEILL. Sir, I would have an objection to that on the same basis as I commented to Mr. Warner about finding the talent.

I think if a person has demonstrated talent and he can solve a problem, he's the one you want to hire.

Senator LEVIN. Would you have any problem with prohibiting any person who was on the SDII board of trustees serving as an officer in the SDII?

General O'NEILL. No, sir, I would not have any problem with a person serving on the board serving as an officer. That's usually what happens. Very often, a member of a board of trustees is also the CEO or the president of the company. So I don't object to that at all.

Senator LEVIN. Let me read to you now from the by-laws of the board of trustees of the SDII.

It says that, "nothing herein contained shall be construed to preclude any trustee from serving in any other capacity or receiving compensation for any such service. Trustees who also serve as officers of the corporation shall not be allowed an honorarium for attendance."

So it's very clear in the by-laws here that the trustees can also be officers.

Now you've got your Tinkers-to-Tinkers-to-Tinkers completed, because you've got people who are on the Advisory Committee of SDIO recommending that an SDII be created. Lo and behold, some of them are on the SDII board and make the proposal that's approved by the SDIO. Then in that proposal are salaries which presumably they put into the proposal, which they are then eligible to collect if the become SDII officers.

That's what it says in the by-laws which I just read to you.

General O'Neill. Yes, sir. As I said, we want to answer that question for the record because I think the answer is they can't be officers of the SDII if they're members of the board of trustees.

Senator Levin. Why couldn't they be?

General O'Neill. And members of the advisory committee.

Senator Levin. Their by-laws say they can be.

General O'Neill. It's the Tinker to Tinker to Tinker thing. Two out of three is acceptable.

Senator Levin. General, their by-laws say that they can. Are you saying that the by-laws are inaccurate, too?

General O'Neill. I'm being told that we probably should not answer questions about how the SDI is running itself because——

Senator Levin. Well, are you familiar with their by-laws?

General O'Neill. I have not read those by-laws, no, sir.

Senator Levin. All right.

General O'Neill. They are not a government organization. They're a private entity.

Senator Levin. So, therefore, you would have no way to stop them from doing that?

General O'Neill. I'm very interested in those by-laws, sir. I will read them.

Senator Levin. We'll give you a copy so you can do that.

General O'Neill. I will answer that question for the record, yes, sir.

Senator Levin. I'm advised that you folks gave the by-laws to us last night.

General O'Neill. Yes, sir. As part of the proposal, yes, sir.

Senator Levin. Okay. I think my extra five minutes is long gone by now.

Senator Warner?

Senator Warner. Nothing further, Mr. Chairman.

Senator Levin. Senator Exon?

Senator Exon. I have no further questions, Mr. Chairman. Thank you.

Senator Levin. General, we thank you very much. We will have additional questions for the record. We appreciate your being here.

General O'Neill. Thank you, sir.

Senator Levin. Our next witness is Harry Finley, who's the Senior Associate Director of the National Security and International Affairs Division of the GAO.

Is it Mister or Doctor Finley?

Mr. Finley. It's Mister.

Senator Levin. We will call you, therefore, Mr. Finley.

Mr. Finley. Thank you.

Senator Levin. Mr. Finley, please proceed, and if you can summarize your testimony, we would appreciate it. We'll put the entire statement into the record. And perhaps you'll also let us know for the record who your associates are who are with you today.

TESTIMONY OF HARRY R. FINLEY, SENIOR ASSOCIATE DIRECTOR, NATIONAL SECURITY AND INTERNATIONAL AFFAIRS DIVISION, GENERAL ACCOUNTING OFFICE, ACCOMPANIED BY ROBERT PELLETIER, GAO GROUP DIRECTOR, AND JEFF PHILLIPS, GAO EVALUATOR

Mr. FINLEY. Thank you, Mr. Chairman. Mr. Chairman and members of the Subcommittee, I'll summarize my statement.[1] But I'm pleased to be here today with Bob Pelletier, GAO Group Director, to my right, and with Jeff Phillips, GAO Evaluator, to my left, to discuss GAO's report on the Department of Defense's proposal for establishing a new federally funded research and development center to provide the Strategic Defense Initiative Organization with technical support. The report was prepared in response to a request from the Senate Committee on Armed Services and subsequent legislation, the National Defense Authorization Act for Fiscal Year 1987. Both the request and the legislation focused on alternative organizational approaches for providing SDIO with technical support and the impact of DoD's plans on the new organization's independence and objectivity.

To conduct our assessment, we obtained the views of a select group of individuals. The individuals included 11 consultants with broad governmental, military, industrial, and/or academic experience and the heads of nine DoD-sponsored FFRDCs. Our report is a compilation of those views.

The consultants concluded that the SDIO needs technical support to oversee research program and system integration efforts. They agreed with the SDIO working group's overall effectiveness ranking of the top two and bottom two organizational options.

The consultants found it difficult to compare organizations on the basis of cost and selected no clear favorite as the least-cost option. Cost was not a primary criterion for DoD's ranking of organizational options.

On the independence and objectivity issues:

The consultants reached no consensus on which procurement method—sole-source or competitive selection—would least compromise independence and objectivity of the contractor chosen to provide technical support. DoD invited a group of individuals to submit a proposal rather than engaging in a competitive negotiation process.

The consultants favored some kind of peer review of the proposal to operate the new FFRDC. DoD does not believe a peer review is needed.

The consultants were about evenly split on whether SDIO's veto power over staff selection would compromise independence and objectivity, whereas seven of nine heads of FFRDCs said that veto power over the Institute's head would compromise independence and objectivity. DoD plans to exercise veto power over the selection of the new FFRDC's president.

The heads of FFRDCs reached no consensus on whether the necessity for a sponsor's approval of a work plan would compromise independence and objectivity more than joint agreement on the plan. DoD proposed that SDIO review the FFRDC's work plan every six months.

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[1] See p. 77 for Mr. Finley's prepared statement.

The heads of FFRDCs said that the guarantee of some level of independent research generally enhances independence and objectivity. Although DoD will not commit itself to a fixed percentage of the new FFRDC's budget, it would encourage and allow the new FFRDC to undertake independent research.

The heads of FFRDCs did not believe that the absence of post-employment restrictions would compromise the new FFRDC's independence and objectivity. DoD intends no post-employment restrictions on the FFRDC's employees.

At this time, we would be happy to answer any questions you may have.

Senator LEVIN. Thank you very much, Mr. Finley. Just a few items.

As I understand it, you basically surveyed other folks rather than reaching conclusions of your own.

Mr. FINLEY. That's correct, Mr. Chairman. We compiled their views.

Senator LEVIN. All right. You surveyed nine heads of FFRDCs?

Mr. FINLEY. That is correct. Additionally, we surveyed 11 consultants.

Senator LEVIN. And seven of the nine felt it would be wrong for the SDIO or any agency to have a veto over the president of the FFRDC being created? Is that correct?

Mr. FINLEY. That's correct. They believe that would compromise the independence and objectivity of the organization.

Senator LEVIN. All right. On the peer review issue, seven of the nine heads of FFRDCs felt there should be peer review of the SDII proposal.

Mr. FINLEY. On the peer review issue, Mr. Chairman, nine of the eleven consultants strongly believe there should be some kind of peer review.

Senator LEVIN. Okay. Nine of eleven consultants favor peer review, which hasn't taken place; seven of nine FFDC heads favor no veto over the selection of the president by the agency.

Mr. FINLEY. That is correct, Mr. Chairman.

Senator LEVIN. What is your own opinion on peer review? Do you have an opinion on that?

Mr. FINLEY. Yes. The General Accounting Office has an opinion. In fact, it is the only issue in the report we expressed our opinion.

We believe that there is merit to the consultant's view that there should be peer review.

Senator LEVIN. All right. We have a vote on now and what I'd like to do, if it's agreeable with my colleagues, is to try for completion of this panel. So I'm going to limit my questions on the chance that we might have a few questions each. We could then go and vote and come back.

So I'm going to stop right there. The rest of my questions will be for the record.

Senator Warner?

Senator WARNER. Thank you, Mr. Chairman. I'll be very brief, then.

Mr. Finley, in your judgment, what is the most convincing argument favoring the new FFRDC? And what argument gave you the most concern with respect to the new FFRDC?

Mr. FINLEY. Senator, GAO did not specifically look at the need. What we did was ask the consultants. They believed that the new FFRDC was favorable because of the objectivity and independence that that organization could have.

You also asked what argument gave me the most concern. I recall three comments that the consultants made. The first was the time it takes to set up a new separate FFRDC. They believed it would not be established as quickly as some of the other options. The second, of course, is cost, which was mentioned earlier by the Chairman. And the third was that some of the consultants believe that there may not be enough experts to go around.

In other words, a new FFRDC would be in competition with the other FFRDCs for experts and might have difficulty attracting top-level people.

Senator WARNER. I thank the Chairman. Thank you, Mr. Finley. I'd like to put in one more question for the record.

Senator LEVIN. All right. Thank you, Senator Warner.

Senator Exon?

Senator EXON. Just one question, Mr. Finley. In answer to Senator Levin's question, you said seven of the nine FFRDCs didn't like this veto power. Was that the figure I heard?

Mr. FINLEY. Seven of the nine didn't favor veto power over the head of the Institute. Nine out of nine did not favor the veto power below the level of FFRDC head.

Senator EXON. Nine out of nine below.

Mr. FINLEY. Every one of them, nine out of nine below the head.

For eight of the nine FFRDC's that we talked to, there is currently no veto power over the selection of the President. Only for the Center for Naval Analyses is there veto power currently.

Senator EXON. Well, as interesting as that statistic is, you wouldn't have expected it to be much different from that result, would you? I'm surprised it wasn't nine out of nine, because, obviously, the FFRDCs like the independence that they have now. That's what I'm trying to say.

So that statistic, in and of itself, doesn't carry much weight with this Senator.

Mr. FINLEY. Your argument has merit. It is to their advantage to be independent.

Senator EXON. Thank you. I have no further questions, Mr. Chairman.

Senator LEVIN. The question also is whether they are in fact free from veto power, not just whether they like it that way. Is it your testimony that eight out of the nine current FFRDCs that you looked at, there is no veto power over the selection of the President?

Mr. FINLEY. That is correct, Mr. Chairman.

Senator LEVIN. Okay.

Mr. FINLEY. That's correct.

Senator LEVIN. Thank you. We will take a 10-minute recess to go and vote. Thank you for your consideration.

Mr. FINLEY. Thank you.

[Recess.]

Senator LEVIN. The hearing will come back to order.

We'll now call on a panel of two witnesses: first, Mr. James Hostetler of Kirkland and Ellis, representing the Professional Services Council and the Business Alliance on Government Competition; and the second witness on this panel is Mr. Norman Augustine, who is president of Martin Marietta.

Thank you both for joining us today. We're sorry for these delays, but I think you—in fact, I know you both are at least used to it.

Why don't you each testify and then we'll ask questions of both of you. So it won't make any difference who goes first. Why don't we go in reverse alphabetical order—Mr. Augustine's used to going first because he's at the head of the alphabet, so we're going to give you a treat today.

Mr. AUGUSTINE. Only when you pay bills, sir. [Laughter.]

Senator LEVIN. Mr. Hostetler?

TESTIMONY OF JAMES S. HOSTETLER, KIRKLAND AND ELLIS, REPRESENTING THE PROFESSIONAL SERVICES COUNCIL, THE BUSINESS ALLIANCE ON GOVERNMENT COMPETITION, AND THE AEROSPACE INDUSTRIES ASSOCIATION

Mr. HOSTETLER. Mr. Chairman, I'd like to summarize briefly my testimony.[1]

We believe that the establishment of a new FFRDC to provide technical support to SDIO is unnecessary. We believe that the required technical capability can be obtained in the private sector. The proposal to establish a captive, nonprofit FFRDC is fundamentally anti-competitive.

If the FFRDC is established, numerous private sector companies with substantial technical capabilities will be unable to compete to provide the types of professional support which the SDIO indicates it requires.

From our standpoint, it appears that SDIO is seeking essentially to increase its personnel by 250 or more individuals who will be hired as professional staff to serve with SDII. These individuals will presumably be available to assist general SDIO activities, just as if they were employees of the SDIO. They will, of course, not be limited by federal ceilings on compensation, nor other civil service personnel controls.

The new FFRDC will be able to undertake whatever work is assigned to it without concern for the existence of comparable or superior competence elsewhere. This is true because there's an exception to the Competition In Contracting Act which permits work to be assigned to FFRDCs without the benefit of competition.

Clearly, one of the motivations of the department for seeking establishment of SDII must be to avoid the time, effort and managerial demands which competing various types of projects would require. At the same time, the failure to compete will inevitably result in an inability to obtain the very best technical assistance available on a given project at a particular time in a cost-effective way.

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[1] See p. 90 for Mr. Hostetler's prepared statement.

With that brief background, I would like to just describe what some of these private sector capabilities are in the professional and technical services.

Presently, it's estimated that the private professional services in the United States represent over 270,000 firms, generating over $200 billion in sales revenues and employing approximately 3 million people. Over the past 12 months, February 1986 to February 1987, approximately 2.7 million jobs were created, 40 percent of which were managerial and professional specialty, the highest paid category classified by the Labor Department. This large and dynamically growing sector represents one of the real strengths of the U.S. economy, and to set up a new FFRDC in competition with it seems very short-sighted and counter-productive.

Let me deal briefly with some of the specific concerns we have with the Administration's proposal.

First, it should be recognized that if SDII is established and if history repeats itself, then DoD's stated interest in limiting the scope of the proposed institute will probably be unsuccessful. Experience shows that, once created, FFRDCs tend to expand beyond the intent of their original mission, to perpetuate themselves, and are only terminated with great difficulty.

Second, the Defense Department has stated that the establishment of SDII is necessary so that certain functions can be performed without a conflict of interest. We believe this argument is contrary to actual experience in using independent private sources of expertise on sensitive government needs free of conflict of interest. The majority of firms that are available to serve the needs of SDIO do not produce or manufacture hardware and are not affiliates of hardware-producing firms. In addition, many companies do not contract with any hardware prime contractors, and of those that do, most accept clauses that restrict contracting with hardware prime contractors on related technology.

The fact is that the issue of conflict of interest can be dealt with by appropriate contractual clauses.

Third, there's been some dispute about the willingness of private sector companies to provide services comparable to those which SDII would provide. The fact is that DoD has made no serious effort to ascertain the capabilties or willingness of the private sector to provide those services.

The type of work contemplated for the new institute is work routinely done in the private sector. We think that the qualifications of the private sector are demonstrable. To cite one example, the Air Force presently relies on TRW to provide the support for the Intercontinental Ballistic Missile program, a program that formerly had been supported by Aerospace Corporation and FFRDC.

Finally, a brief comment on the two recent reports which we've heard about a good deal this afternoon.

GAO has provided a report, and I think if you look at pages 22 and 23 of the report, which scores the organizational options, you'll find abundant evidence that for-profit firms in many ways are as desirable as an FFRDC to meet the needs that the Defense Department has.

We would further point out that the opinion sample from 11 consultants seems not to be a substantive basis upon which to make some important policy judgments.

Finally, we would mention the Congressional Research Service report. It is a balanced report which sets forth in clear terms many disadvantages which flow from reliance on a new FFRDC. CRS clearly recognizes that the SDII option is not necessarily preferable to private sector alternatives.

The fact is that highly qualified private sector firms are able and anxious to provide the service.

That concludes my testimony. I'll be glad to try to answer questions after Mr. Augustine.

Senator LEVIN. Thank you very much, Mr. Hostetler. I notice that the fact that you also represent the Aerospace Industries Association was inadvertently left off the hearing notice. We apologize for that because I listed two of the groups that you represent, but left out the third inadvertently.

Mr. HOSTETLER. Thank you, sir.

Senator LEVIN. Now, Mr. Augustine, we turn to you. We know that you came here on particularly short notice, shorter than I guess just about any other witness. We're grateful that you were able to do that.

TESTIMONY OF NORMAN R. AUGUSTINE, PRESIDENT, MARTIN MARIETTA CORP.[1]

Mr. AUGUSTINE. Well, thank you, Mr. Chairman. I'm very happy to be able to assist the committee in any way on this issue.

At the outset, I would want to state that I serve as president and chief operating officer of Martin Marietta Corporation, which is a firm of substantial SDI-related contracts. I also would like to speak as an individual, as one who served in government and in an advisory capacity with an FFRDC myself, as well as an overseer of a national laboratory.

I'm aware of the differences of opinion expressed on this matter to date, including the reservations expressed by you, Senator Levin, and others in the Congress. Throughout the discussion on this subject, there appeared to me to run a common thread: the importance of an objective, competent review process to the success of SDI. On this, I believe there can be little argument.

Certainly, as we approach the crucial systems decisions and technology choices of the future, General Abrahamson's challenging task will be made easier if he's afforded the benefit of expert opinion insulated from the whirlwind of controversy which seems inevitably to attend our strategic systems these days.

Similarly, the Congress requires assurance that the taxpayers' money is purchasing the most effective systems that industry can provide.

Perhaps the most telling circumstance to justify such is the spectacle of so many eminent scientists, engineers and military experts holding completely different and, in many cases, mutually exclusive, views on the feasibility, cost and utility of a strategic defense system. Clearly, what is required is a professional process of review and synthesis, conducted by authorities in their respective fields. Most importantly, they need to be able to reassure all sides that the results have validity and integrity. Only then can sound decisions be made.

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[1] See p. 108 for Mr. Augustine's prepared statement.

Where the differences arise, as usual, is in the implementation. The General Accounting Office, in its report, evaluated eight options, including government and non-government, new and existing entities.

Speaking on my own behalf, as an individual, I believe, and I believe strongly, that the government should do only those things which cannot or should not be done by the private sector. This predisposition, or bias, if you will, runs up against two issues in this instance of the SDI Institute.

First is the concern over a perceived or real conflict of interest. Much of the systems engineering and systems integration expertise in this country is resident in private industry, in many cases in firms with substantial hardware interests in SDI. Finding the right mix of talent and expertise is difficult. Finding such an organization devoid of potential conflicts is even more so.

The other issue is my experience in the 1950s in industry and in the 1960s and the 1970s in government dealing with anti-ballistic missile systems. First, when I worked on the Nike-Zeus program and later with the Safeguard and Sentinel programs in industry and government, I saw the virtues of FFRDC-type analyses.

Thus, I sought to read the GAO report with some degree of balance of perspectives. I felt it clearly showed that each option has its advantages and drawbacks, but, again, a common thread emerged. That is, that with the exception of comparative costs, in which there was no clear advantage, the establishment of a new FFRDC can be deemed the preferred option.

I believe that I would concur with this assessment. If I were General Abrahamson and, indeed, if I were a Senator having to make important funding decisions, I would want to have in SDIO or available to SDIO a full-time resource, one with the independence and the true professional expertise necessary to point out pitfalls and to identify potential breakthroughs.

The other options that were considered seem to fail the test of either objectivity or effectiveness, or both. With respect to an existing FFRDC or national laboratory, I fear that the SDIO might find itself contending with an organization preoccupied with other issues.

For-profit firms, as I mentioned, might have subtle, but real conflicts of interest. In the ecumenical research program that is SDI, such biases could be especially harmful. And given the temper of the times, an expansion of SDIO or the DoD staff would and, in my opinion, should be met with a jaundiced eye here on Capitol Hill.

Thus, to meet our agreed requirements of objectivity and competence, a new FFRDC would seem to me to be the wiser choice.

Beyond the issue of what we should establish, there remain a number of thorny problems to which this hearing has already alluded, such as personnel selection, oversight, salaries, and so on. Certainly a fair and manageable arrangement does seem to be achievable.

With regard to the choice of an FFRDC director, I don't really see how the director of the SDI office can be or should be completely excluded from such a decision. In his role as manager, General Abrahamson will need a responsive asset to help him deal with the welter of activities and conflicts inherent in such an enterprise. Yet, in his role as an executive, he will need to be able to count on an independent, sometimes even adversarial, voice to test the thrust of his program.

This seeming paradox between responsiveness and independence can be resolved, I believe, by the establishment of a very strong board of directors, composed of respected individuals whose integrity is proven. In this way, General Abrahamson can have a director compatible with the imperatives of such a specialized research program, and yet, the public can be assured of a board sensitive to the imperatives of objectivity.

In conclusion, I would point out that some of our most outstanding engineering achievements have been realized with the assistance of organizations such as the one being proposed. Rand, IDA, CNA, Aerospace, and a host of others have helped in a fashion along this line.

At least as important as those systems which have been successfully fielded are those which have been successfully weeded out, so called "turkeys" that never saw the light of day. It is here that an FFRDC truly earns its keep by preventing flawed technology and ineffective systems from draining our resources and diverting the talent of many fine engineers.

The Nation, as you well know, has invested significantly in the program which is seeking to free us from the threat of nuclear attack. We do have superb technology and some of our finest engineering talent in the country working on this task. Given a sound and objective review, it seems most likely that SDI can produce developments of lasting value to the free world.

Mr. Chairman and members of the Committee, I would be happy to take any questions you might have.

Senator LEVIN. Thank you very much, Mr. Augustine.

Let me start off with you. You indicated that there's no clear favorite on cost, the way you read the GAO report. But the GAO charts ranks a new FFRDC as number six out of eight options. If, in fact, it were true and you learned that a new FFRDC would be, say, twice as expensive—just assume that for a moment—twice as expensive as an existing FFRDC, would that affect your assessment?

Mr. AUGUSTINE. That's a good question. I found the GAO report frankly confusing in this regard. It says here in their summary, "Unlike our effectiveness ranking, there was no clearly preferred organizational approach in the least-cost category, as indicated by the large number of organizations that received first or second place rankings."

In studying their numbers, I interpreted their finding to be that there were so many different opinions expressed, it was hard to point to a clear cost advantage. To address your question, which I think is probably a more appropriate one, if the organization costs twice as much and clearly could make a major impact in dealing with these billions of dollars of issues that we're dealing with, I would think it would be worth it.

In actuality, I would be surprised if the cost differences were anywhere near a factor of two.

Senator LEVIN. So basically, it would depend on whether or not it would have a substantial impact, and that's something which I gather you're not in a position to assess, other than to say that if it would have an impact, it might be worth twice as much.

Mr. AUGUSTINE. Yes, I think that's true.

Senator LEVIN. If it wouldn't have that significant additional impact, it wouldn't be worth twice as much.

Mr. AUGUSTINE. Yes. I think you're dealing with an organization here with a few hundred people, which, if my arithmetic is right, that probably costs like $20 or $30 million. And you're affecting a program of several billion dollars.

So if the effectiveness is there, it's well worth the additional cost, although I don't believe there's a factor of two that we're talking about. I do think, though, that to be effective, they've got to be truly professional, with the highest quality people. They have to be objective.

It's hard for me in this particular case, and this goes against my preset biases, it's hard for me in this particular case to see how an industrial firm or any for-profit firm could not be suspected of a conflict of interest.

Senator LEVIN. We'll have some testimony on that a little later, I think.

Mr. AUGUSTINE. Fine.

Senator LEVIN. But perhaps we can get a reaction from Mr. Hostetler on that issue now.

Would you comment on that last comment of Mr. Augustine?

Mr. HOSTETLER. I think it overlooks one substantial fact, and that is there are a number of firms that are independent sources of professional services. They produce no hardware. They have no outside members on their board. They're very scrupulous about entering into arrangements which deal with the very issue that does raise some concern about independence and objectivity.

So I think that there is ample evidence in terms of companies already performing highly sensitive work in the intelligence and defense fields that SDII's needs can be met by private sector firms free of conflict of interest.

Perhaps the answer would be to give this sector an opportunity to see if they are willing to enter into appropriate arrangements.

Senator LEVIN. That's the next question--whether or not it isn't basic wisdom to be soliciting proposals here from a number of sources and then judging them, rather than to decide on one particular source and announcing that's going to be it.

That's what troubles me about the sole source approach here. We'll start with you Mr. Hostetler—well, let me start with Mr. Augustine because I think this is probably something that Mr. Augustine hasn't addressed and perhaps you already have, Mr. Hostetler.

Why not solicit proposals here and then judge them perhaps with some outside review?

Mr. AUGUSTINE. I see no problem with that. As a matter of fact, I would think that that would be constructive.

I suspect what's happened here is that there are not a lot of—if you'll accept that an FFCRC--what is it? I don't think that's right. [Laughter.]

Whatever it is, if you'll accept that that is the right solution, I suspect there are not a lot of people standing out there that are very eager to go form those organizations. So it might be there's only one.

You could also build an argument that it would be better to have one with all the best people on it, rather than to have 10 proposals with the better people split among 10, of which you could only choose one.

On the other hand, I do think it would be worth at least finding out what the options are if there are some other possible candidates. Hopefully, that could be done rather quickly. I think you may find you wind up with only one, but you might not.

Senator **Levin**. Would you be willing to look at proposals from existing FFRDCs too?

Mr. **Augustine**. I would be, were I General Abrahamson, although I think I'd be less optimistic that that would be very successful. I'm the chairman of the advisory board of one of those organizations and I've worked closely with many others. As I said, our corporation is responsible for running a national laboratory right now, so I have some familiarity with these organizations.

I think that most of them have specific sets of expertise, many of which don't relate well to this issue. Although I dislike finding myself in disagreement with the representative of the AIA, which I happen to also be associated with——

Senator **Levin**. Still?

Mr. **Augustine**. Still. I hope so. I'm not sure. [Laughter.] We'll find out. [Laughter.]

But I really do think that this is a very unique case where the questions are being asked as to what you should do, how should you spend money, not rather than actually to implementation.

I think TRW for instance, is a superb organization, in overseeing the effective expenditure of funds, but this organization really is going to have to advise on where you spend funds, what you spend it on.

Senator **Levin**. Have either of you read the SDII proposal?

Mr. **Augustine**. I've not, no.

Mr. **Hostetler**. No, I've not had an opportunity to see that.

Senator **Levin**. I understand the SDII proposal contains proprietary information, so it's not subject to being reviewed—so I should have known the answer to that question without even asking it.

I'll address this to Mr. Hostetler. The CRS report on SDII states that:

> Since the mission proposed for the SDII requires such great depth of knowledge across the entire spectrum of technologies and concepts associated with SDI, it appears doubtful that any single organization can acquire all the top personnel required to adequately perform all of the stated functions.

Could one research organization gather all the scientists that it needs to cover every aspect of SDI?

Mr. **Hostetler**. It seems to me that the best answer that I can give to that question is that you can find in different organizations around the United States substantial core capability. I doubt very much that any one organization at this time could say that they could do everything that this program is going to require.

But that core capability can be supplemented. It's going to be a demanding task, but, frankly, less demanding than to start from Ground Zero and to try to attract the highly competent technical personnel that SDII needs to have to consider the broad range of things that they're going to do.

So my disposition would be to find the core capability and either by hiring additional technical skills, bring together the team or, as they're doing right now, form an ad hoc team to deal with tasks as they are identified and they have to be addressed.

It's a complex managerial challenge, but I suspect no greater than others that we've been successful in dealing with.

Senator LEVIN. Mr. Augustine, the question of conflict of interest in the use of for-profit firms troubles me a bit. Does that possibility raise questions about the advice which has already been given to the SDIO by for-profit firms? Should we look at SDIO's recommendations and decisions and say, now, to what extent was that based on advice from the private sector, and then have doubts about it because they made a profit out of it?

Mr. AUGUSTINE. No, I think it relates to the type of a question that's asked. For example, if you want to find out what is the best type of a missile to design, A or B, you'd probably better go to companies that build missiles and they all hopefully make profits.

On the other hand, if you want to decide whether you should build a missile or not build a missile, or whether you should build a missile or a laser, it might be that you want to have somebody more independent than an industrial, profit-making firm.

Senator LEVIN. Okay. Do either of you want to add anything else?

[No response.]

Senator LEVIN. Again, we're appreciative of your being here. I think your statement, Mr. Augustine, was given in full.

Is that correct?

Mr. AUGUSTINE. Yes, very nearly. Yes, sir.

Senator LEVIN. All right. I believe, Mr. Hostetler, yours was summarized, although I may be wrong.

In any event, the statements will be made part of the record in full. Any additional material you want to submit that you think about, we'd be happy to insert in the record. We may have additional questions for you.

Mr. AUGUSTINE. I'd be happy to take them.

Mr. HOSTETLER. Thank you, Mr. Chairman.

Senator LEVIN. Thank you.

Our final panel is made up of Dr. Robert Park, who is the director of the Washington Office at the American Physical Society, and who is accompanied by Dr. Patel, who is the director of physics research for AT&T's Bell Labs; and also Dr. Robert Cooper, who is President of the Atlantic Aerospace Electronics Corporation, and the former director of DARPA.

We welcome you all. Again, if it's all right with you—I think Dr. Park has got a problem scheduling-wise, perhaps all of you do—why don't you summarize your testimony, perhaps five minutes each, and we'll follow the same format.

Is that all right?

Dr. Park. That's fine.

Senator Levin. Thank you. Dr. Park?

TESTIMONY OF DR. ROBERT PARK, DIRECTOR, WASHINGTON OFFICE, AMERICAN PHYSICAL SOCIETY;[1] AND DR. C.K. PATEL, EXECUTIVE DIRECTOR, RESEARCH, MATERIALS SCIENCE, ENGINEERING, AND ACADEMIC AFFAIRS, AT&T BELL LABORATORIES

Dr. Park. Mr. Chairman, the American Physical Society recently released a report of a major study, the Science and Technology of Directed Energy Weapons. I believe that report may be instructive in discussing the need for independent technical advice on the Strategic Defense Initiative.

There was great concern in the Physical Society as we undertook that study to ensure the independence of the study group and the objectivity of the results, and also to ensure that there be every appearance of objectivity and independence. I would like to describe some of the steps that we took to ensure that. It's not an easy thing to do, to be independent and to preserve the proper appearances of independence.

Funding for the study was not sought from the Department of Defense. We did at one point approach the National Science Foundation for funding, but we felt to go any further than that in government funding would impair the appearance of the group. Funding was provided privately by the American Physical Society, with the assistance of the Carnegie Corporation of New York and the MacArthur Foundation of Chicago.

Assurances of cooperation were received in advance from the Science Advisor to the President, the Under Secretary of Defense for Research and Engineering, and the Director of SDIO. That cooperation, in the form of classified briefings, was generously and professionally provided by SDIO.

The APS Study Group was a broadly constituted panel whose distinguished members were drawn from major universities, industrial and national laboratories. Many have extensive knowledge of weapons technologies.

We had our own internal peer review, internal to the American Physical Society. A separate review committee of very senior physicists, with many years' experience in providing the government with technical advice, was named to advise the panel on the final report.

The co-chairmen of the study group, Dr. Nicolaas Bloembergen, Nobel Laureate of Harvard University, and Dr. Kumar Patel, an Executive Director in the research organization at AT&T Bell Laboratories, are renowned for their pioneering research on lasers.

And Dr. Patel joins me here today.

Members of the Study Group included the Director of MIT Lincoln Laboratory, a Technical Director of the Air Force Weapons Laboratory, the former Director of the Lawrence Berkeley National

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[1] See p. 117 for Dr. Park's prepared statement.

Laboratory, an associate of the Arms Control Center at Stanford University, a member of JASON, plus several members of the National Academies of Science and Engineering.

They represent a wide range of talents and backgrounds in nuclear physics, solid state physics, lasers and particle beams, electronics, optical and microwave technologies, and have extensive experience in technology evaluation and systems analysis. In spite of the diversity of the panel, their report was unanimous.

The review committee, headed by Dr. George Pake of the Xerox Corporation, included two scientists, Arthur Schawlow of Stanford, and Charles Townes of the University of California, Berkeley, who earned Nobel Prizes for their work in lasers.

And if I could, I would ask Dr. Patel to briefly summarize what the panel learned from its study.

Senator LEVIN. Thank you. Dr. Patel?

Dr. PATEL. Mr. Chairman, our study primarily looked at what are called the directed energy weapons. These are lasers and particle beams. What we looked at were two aspects. One was where the physics stands and how much of physics and science we understand today. And the second one was where the technology stands and where it has to go.

In the roles that these weapons have to play within the context of ballistic missile defense, it is not difficult to determine the performance levels required for each one of these technologies. From there, a very quick assessment can be made in terms of where the various technologies stand in terms of meeting those requirements. And what we found was that in many of the cases, the lasers and particle beams, the required power levels or the required performance levels exceeded what has been achieved under the best of circumstances in laboratories by a factor of a hundred and in many cases, as much as a factor of a million.

In many cases, the fundamental physics is not known. The ultimate conclusion that we come to is that over the past 20 years or so, a substantial amount of progress has been made in many of these technologies, but there is a long way to go.

From the collective judgment that we had on our committee of 15 people, we came to the conclusion that there is a need for at least a decade or even more of intensive research to be able to answer many of the questions needed before an informed decision can be made regarding the potential effectiveness and the survivability of the directed energy weapons systems.

Now, the question about unanimity is an important one. The group consisted of individuals from universities, individuals from industry, individuals from national laboratories, people who have worked on directed energy weapons and are working at the present time.

There was no dissent in terms of these conclusions that we drew up because those conclusions come from a very rational evaluation of where we stand.

So those are our findings in terms of the directed energy weapons.

Senator LEVIN. Thank you, Dr. Patel, very much.

Dr. Park, do you want to pick up from there?

Dr. Park. Thank you. In commenting on the APS study, SDIO acknowledges that the panel "astutely applied physical principles in their analysis," but finds the conclusions to be "unduly pessimistic."

Certainly, the Department of Defense could not be charged with "undue pessimism" in its own assessment of the feasibility of SDI. The Secretary of Defense, in a speech last week to the Commonwealth Club of California, declared that "The question for the United States today is not, can we build an effective strategic defense? I am confident we can." It is a confidence that is not shared by the APS panel of scientific experts.

Perhaps a little less optimism would be appropriate. The American people are being asked to risk enormous waste of financial and human resources on deployment of SDI components in a state of technological uncertainty, a deployment that may make us less, rather than more, secure. I do not believe the decision to press for early deployment is motivated by independent scientific advice.

This, then, is the problem. The sort of unsolicited scientific evaluation provided by the APS study of directed energy weapons fills an important need in our open system of government and should be heeded. It represents the most independent assessment available. It does not, however, satisfy the need of SDIO for timely responses to the wide range of technical questions that will arise in efforts to integrate so complex a system.

The question that must be addressed is will the proposed SDI Institute provide that timely response in an objective and independent fashion? Now in any FFRDC, there is less independence than you're going to have in the kind of panel that the American Physical Society provided. That's a necessity. There's no way to avoid that.

But I think there are some real concerns in the proposal, as I understand it. In the first place, is the creation of an SDI Institute premature? FFRDCs are normally associated with the implementation of programs involving mature technologies and are perhaps not appropriate to a purely research program. If the intent is to support a program of early deployment, then my reservations are stronger.

It is the judgment of the Council of the American Physical Society that there should be no early commitment to the deployment of SDI components, based on the results of our study.

Second, would the SDI Institute that is proposed be sufficiently independent? The Institute should feel no pressure to trim technical judgments to conform to political priorities.

Organizationally, the Institute should have as few links to SDIO as possible. The requirement, for example, that senior staff of the Institute all be committed to the goals of the program, I thought to be unwise. But General O'Neill tells us that the proposal is incorrect in that regard.

SDI at the present time has plenty of cheerleaders; a few skeptics might be helpful. Objectivity is hard to find in the absence of independence.

Thank you, Mr. Chairman.

Senator Levin. Thank you. If Dr. Cooper would bear with me, I'd like to ask a few questions of Dr. Park and Dr. Patel, run to vote, and come back for his testimony. You're familiar enough in your older job to understand what I'm going through here.

Dr. COOPER. Exactly.

Senator LEVIN. If you can bear with me, I would appreciate that. I also know that Dr. Park and perhaps Dr. Patel have a particular scheduling problem in the next 20 minutes or so.

Dr. PARK. Dr. Patel does. I can stick around.

Senator LEVIN. I see. Let me just ask you two this. If the membership of the SDII board of trustees were taken substantially from the SDI Advisory Committee, would that create problems for you?

Dr. PARK. I personally would have great qualms about that sort of arrangement, yes.

Senator LEVIN. Given the skepticism that exists in the scientific community relative to some of the announcements by the SDIO, and given the report which just came from your community, do you believe that there should be some people on the SDII board who are skeptics, as you phrased it?

Dr. PARK. I believe so. I would like Dr. Patel to respond as well.

Senator LEVIN. Dr. Patel?

Dr. PATEL. I believe the best scientific and engineering progress is made when questions are asked regarding the feasibility of something, rather than going along with the requirement that something be done. An independent advisory board is always desirable, often difficult to get. But I think the presently conceived format of SDII does not provide for an independent advisor.

Senator LEVIN. Do I understand, then, your answer to be that you feel that there should be a cross-section of views about the SDI program represented on an SDII board?

Dr. PATEL. A variety of scientific views ought to be represented. A variety of engineering views ought to be represented. But these are purely scientific and engineering issues and not political issues. I don't believe there is a need to balance the board from political——

Senator LEVIN. No, I was speaking in terms of the scientific and engineering views.

Dr. PATEL. Yes, sir.

Senator LEVIN. The SDIO has indicated that while existing FFRDCs can perform the research that it wants the SDII to do and could do it at less cost to the taxpayer, the SDIO doesn't want to go with an existing FFRDC because existing ones might favor one technology over another; none has all the expertise that SDIO needs under one roof; and no existing FFRDC is dedicated exclusively to the SDI program.

I'm wondering of both of you gentlemen, who we'll try to excuse in about three minutes, whether or not these are persuasive arguments, in your view, for not using or considering an existing FFRDC?

Dr. PARK. It seems to me that to build an FFRDC from the ground up is far more difficult than to supplement the expertise that you already have in an existing FFRDC.

But I suppose there are other questions again having to do with issues of the timeliness of response and that sort of thing. You might wish to have an FFRDC that's completely committed.

But, again, it seems to me premature to have an FFRDC in any case, unless this is a step in deployment, which I believe would be a mistake.

Senator LEVIN. Dr. Patel?

Dr. PATEL. I believe that's a correct statement. The FFRDCs have proven of significant value, as Bob Park mentioned, when one is dealing with mature technologies rather than technologies in a stage of deployment.

I think one has to make sure that one does things in the right order so that our wires do not get crossed. I believe the necessity for such an FFRDC ought to be documented before we discuss how it is done or what it should look like.

Senator LEVIN. Finally, if there were a perception that the SDII were under the control of the SDIO, would that, in your opinion, diminish its ability to attract top talent?

Dr. Patel, can we start with you? If we created one and it looked like, indeed, it was just a captive of the SDIO, what effect would that have on its ability to attract top scientists?

Dr. PATEL. That's a difficult question to answer in abstract. But, generally, top scientific and engineering people like to have the freedom of arriving at unpopular decisions and their paychecks not being jeopardized. I believe a totally captive institution faces the danger of ruling out some number of individuals who may not feel comfortable.

Senator LEVIN. Thank you. Dr. Park, do you want to comment?

Dr. PARK. Well, with some of the salaries that I heard quoted today, they may be able to offset that difficulty. [Laughter.]

Senator LEVIN. All right. We thank both of you. We will now take about a 10-minute recess.

Dr. Cooper, we're doubly grateful to you for your understanding as well as your being here on short notice, because I understand you had short notice, as well as just about everybody did.

We will pick up at ten minutes to 5:00.

[Recess.]

Senator LEVIN. Dr. Cooper, let us thank you again and welcome you. As I indicated, Dr. Cooper is a former Director of DARPA. We are particularly appreciative that on little or no notice, you were willing to come here today. Again, you can proceed as you wish. If you have a long statement, we would appreciate your summarizing it. And we'll ask you some questions if you're still patient with us.

TESTIMONY OF DR. ROBERT S. COOPER, PRESIDENT, ATLANTIC AEROSPACE ELECTRONICS CORPORATION AND FORMER DIRECTOR, DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

Dr. COOPER. Thank you, Mr. Chairman. I appreciate the opportunity to come and talk with the committee today. The committee really has been right on the money, I believe both yourself and the others, in asking the key questions. What I intend to do now is be very brief and to answer, to give you precise answers to all those questions, which I want you to write down and make sure that you incorporate into your agreements with the Strategic Defense Initiative. [Laughter.]

Senator LEVIN. I've got my pen ready.

Dr. COOPER. Okay. First of all, I'd like to say that I have had a long association with the FFRDCs, having been a staff member and a member of the senior management of the MIT Lincoln Laboratory. I also have been director of the NASA Goddard Space Flight Center for a number of years, and as assistant secretary of defense and director of DARPA, I dealt with virtually all of the FFRDCs as a sponsor to their activities.

Down through the years, I've interacted with virtually every one of the FFRDCs in one role or another. So, basically, what I'm going to tell you is not what my personal opinion is of this proposal which has been put forward by General Abrahamson, but I'm going to tell you what works in the FFRDC world, as I understand it, and to try and interpret that in terms of what General Abrahamson needs right now in his quest for the Holy Grail of strategic defense for the Nation.

First of all, he can't possibly acquire the technical support that he needs either in the community of the aerospace industries or in the totality of the federal laboratories; that is, the Army, Navy, Air Force laboratories. Consequently, he really must seek quality, independent advice and help, particularly in the system integration area outside of that. And it's natural for him to think of going to the Federally Funded Research and Development Center. And he has. For instance, he has major contractual activity going on at Lincoln Laboratory, at the Mitre Corporation, and at the Aerospace Corporation.

As a matter of fact, at Lincoln Laboratory, the SDIO work represents 25 percent of all of the work that's being done in the laboratory today. And I would suspect that among those three major FFRDCs, there is activity going on that exceeds by a factor of two, maybe, or even three, the size of the effort that he would expect out of his proposed new SDI Institute.

So I think that the committee really has a decision to make which is one of two particular decisions. Should they recommend that General Abrahamson continue to work with the existing FFRDCs and to try to get all that he needs in the way of system integration out of them? Or should he create a new organization? And how does he get one that has the substantial independence that would be needed in order to get quality advice? And how does he create one in a reasonable period of time where he can actually get quality scientific and engineering effort on his side, working on his problem?

Well, as I said, I know the history of the start-up of these institutions. In particular, Lincoln Laboratory was started after the Second World War, in the early 1950s, to deal with the air defense problem, the CONUS air defense problem, a similar kind of situation. There was a perception of a major threat from the Soviet Union. Lincoln was started up to do research and development on air defense concepts and technologies.

And when the time came for a system deployment for the Sage system to be deployed, a piece, about 33 percent, of Lincoln Laboratories spun off as the Mitre Corporation to do the SE&TD, the scientific engineering technical direction effort that was required to create that Sage system, which was our principal CONUS air defense system in the late 1950s and 1960s.

Lincoln's role then shifted considerably and it became involved in ballistic missile defense and was heavily involved in the Defender program and later on in support for the Safeguard deployment. Of course, they were not the SE&TD for that. They did basic research and gave advice to those people who were in charge of the development program. The Bell Telephone Laboratories were the principal architect and system engineer for the Safeguard system as it was deployed.

If you look back at this kind of history of each of the major laboratories, of Lincoln, of Mitre, of JPL, of Livermore, Los Alamos, you see that the one driving force in all of their creations was that there was a major issue, a major national security issue that was facing the nation and it required very competent, independent technical research and development and advice.

What I'm going to do now is to give you four overarching principles that I've seen that made those institutions work and work well for the particular purpose that they were created.

First of all is the number one thing, and that is that these organizations should be created if, and only if, there's a long-term, overriding national interest that needs this kind of support. The reason for not creating new institutions when this factor is not present is that these things will last virtually forever.

And so you're not signing up to the first $35 million; you're signing up to $35 million times the number of years that these institutions will be there. And many of the ones that we have today have been there for 30 years or longer. Consequently, what you're signing up for is 30 times that amount if you never let them grow. And beyond that, they may grow. So the price, the cost to the government has to be worth the effort.

The second overarching principle is that it should be required that the organization be close to, physically close to and somehow managerially attached to a high quality technical university. There's no question that if you racked the current FFRDCs up, one, two, three, four, according to their capability and effectiveness, you would find out that the ones that are most closely associated with the universities are the most effective and are the best and have maintained their excellence the longest.

And so if you create such an institution, you should find a way to attach it directly to a university and to have it physically close and to have a sort of relationship there which is understood from the beginning, a condition that may be very difficult for General Abrahamson to achieve on this go-round.

The third thing in order to provide substantial independence, which is what you're after, there's only really one way to do that. Independence goes along with financial independence. And so, you must provide a substantial basis for long-term independent funding to support research and development in that organization that is independent of the SDIO funding.

Now that doesn't mean that there shouldn't be substantial SDIO funding invested in that organization, but it should have a major piece of funding of its own. Five percent, ten percent is not nearly enough of their total effort. It should be much, much larger than that.

Now I'll give you some view in just a moment of the history of that independent funding and how it is generally applied and what has happened to it over the years for the best of the FFRDCs.

And finally, it should be required that some portion of the engineers and scientists in that organization do hands-on research and development, laboratory research and development.

Now let me just make a few observations and then I'll close and you can ask whatever questions you want on that. I can give you some more details perhaps during the questioning period.

First of all, an observation is that research and development institutions of this sort seldom die and they don't even fade away. They will persist long after the Strategic Defense Initiative Organization is gone, if you create such a new organization. So I wouldn't call it an SDIO Institute. I would call it a defense research organization, or something. Maybe even a strategic defense research organization. But divorce its name and the thrust of it from the existence of SDIO, which may or may not be transient. We had corresponding institutions back in the 1960s, as we were developing the Safeguard system.

So I think you should view this thing as something that you create which is going to endure and it's going to have a role in the defense research and development community for a long time, and its role and its character may change over time. You should create it in such a way that it can have enduring and continuing value because the constituencies that will be built here in Congress and in the communities in which they're engaged will certainly cause this organization to endure.

That's observation number one.

Number two, it's not easy to create a quality R&D organization, and a quality organization is what Abe needs. It's nearly impossible to do that without some close association with a quality university or a student and faculty community that can feed some of its best and finest, most talented people into the organization. If you don't establish that relationship from the beginning, as was established at Lincoln, at JPL, at Livermore, at all of the major, very effective FFRDCs, then this organization will start with some level of competence and capability and its level of competence and capability will inevitably decline until it is ineffectual.

It will never go away and the cost will still be there; it just will not be effective.

On the issue of hardware, if mastery of hardware is the sponsor's end goal, and in this case, it is, if the ability to master some major system or to create some hardware to do a defense mission which doesn't exist is the end goal, then this organization will lose its initial technical competence if it's relegated to just a studies and analysis organization, or one that does technical direction only. It really has to have competence—that is, laboratory, hands-on experience in the scientific and engineering disciplines in which it's making its judgments. That's the only way that you're going to be able to acquire and retain very high quality technical personnel.

Those are the principles and observations that I make for you. I guess I'm open to any questions you have about these. I think that all of these things are possible roughly within the framework of what General Abrahamson has proposed to the Congress, and I believe in relationship to what the Congress' goal in such a program might be. I would judge from the questions that you've asked and the answers that you've tried to seek, that minor modifications in the positions of both sides are possible which would achieve these things and achieve the goals of both SDIO and the Congress.

Thank you, Mr. Chairman.

Senator LEVIN. Thank you, Dr. Cooper. I'm not sure about the minor modification comment. It depends, I guess, on what one calls "minor."

For instance, I would think that the SDIO ought to solicit proposals and not just have one sole source proposal. That may or may not be viewed as minor.

Would you view that as minor?

Dr. COOPER. Well, I would agree with you that some measure of competition is possibly in order here. But I think that the thing that's being done is so fundamental, that the techniques, the typical techniques that are used by the Defense Department now to solicit proposals and to assure competition really will not work.

I think what you have to do essentially is find some very competent engineers who are willing to devote a significant fraction of their career to starting up such an organization who have attachments to a university community already and invite them to come forward with proposals to start up such an organization.

It's going to take years to do that if you start from scratch. Otherwise, the only other alternative is to go to one of the existing organizations, such as Mitre or Lincoln or the Aerospace Corporation, and clear out the other sponsors because you'll have to just clear them out of the way over a period of maybe one, two or three years, and to put the substantial engineering integration effort into that organization.

Senator LEVIN. Would you agree that the SDIO ought to issue the kind of invitation that you've described to one or more groups and invite other proposals, even if the proposals don't fit their precise idea at the moment?

Dr. COOPER. I would believe that would be a good thing to do. But, again, I don't think it can be done in the ordinary way. I think it has to be done as a personal initiative of the director of SDIO, with individuals who have the connections that are appropriate here.

And I would suspect, although I don't know exactly what the process was, that there was some of that already in the technique that was used by General Abrahamson.

Senator LEVIN. As I understand it, if we started down this road and reviewed proposals—how about peer review? Do you think that's appropriate, for instance?

Dr. COOPER. I think it's appropriate to get quality advice in shaping and forming such an organization. It's hard to tell who peers are in this Strategic Defense area. The current management has not drawn heavily on the peer group that was created during the first go-round of our Strategic Defense research of the 1960s and 1970s. They essentially created things pretty much from whole cloth, and they need the best advice they can get, in my judgment.

Senator LEVIN. Would you require down the road, if we reach that point, that a certain percentage of the funding for the SDII be apart from the SDI program?

Dr. COOPER. Absolutely. I think that the appropriate response for the Congress is to create a line item. If you fully intend to support the creation of a new Strategic Defense Initiative Institute, is to create a line item in the budget which has roughly 50 percent of the intended funding for the program in it, that you should also set a ceiling on the number of scientists and engineers which can be contained in that organization. And you should also require essentially that this organization be allowed to seek other sponsors outside of SDIO to sponsor research in their organization.

Essentially, to create a new FFRDC pretty much in the image of the ones that are already here. They have a principal sponsor. They have a line item, typically, in their budget which supports some fraction of the research that goes on in their organization so they can be substantially independent. They have usually more than one sponsor who puts contract money in and so, any one sponsor cannot be so influential that it can totally influence the judgments that are drawn or cannot keep the director of the institute from going directly to the senior management of the Defense Department and giving independent judgments to them privately.

Now I don't believe there's any FFRDC director who I know who would go public, who would come to the Congress with concerns that they might have, unless they're very extraordinary. But they would certainly go, and have in the past, and I know this firsthand, to senior members of the Defense Department and say, look, this program office is not doing the right thing in the proposal it's making and here's the reason why. We've done the research to know that and here's the data to back that up and you really ought to intervene.

That's the kind of thing that's necessary. It's not what our friends from the American Physical Society have asked for, which is more public debate of the efficacy of strategic defense. It's the ability, the independent ability of the director of this organization to go to senior officials in the Defense Department and to give an alternative view without the punitive effects that might result from major reductions in the funding which jiggles the stability of his laboratory and makes it a less desirable place for a quality scientist or engineer to take as a place to work.

Senator LEVIN. Were you here when General O'Neill testified?

Dr. COOPER. Yes, I was, sir.

Senator LEVIN. He seemed to be somewhat startled by the idea of a separate line item in the budget—like that had not been considered.

Did that surprise you? Did you happen to catch that?

Dr. COOPER. Yes. I guess I was not startled by his being startled by that. But I wondered if he fully understood the relationships that current FFRDCs and their sponsors have.

As a matter of fact, if General Abrahamson and General O'Neill had not looked at that relationship carefully for the other FFRDCs in trying to build the concept for their own, I would be surprised.

And so I suspect that they did take that into account, did take the current relationships into account in trying to outline how they would proceed in theirs.

Senator LEVIN. It didn't seem that way to me at all.

Dr. COOPER. It didn't seem so, but it just may have been appearances.

Senator LEVIN. Senator Thurmond?

Senator THURMOND. Thank you, Mr. Chairman.

Dr. Cooper, we're glad to have you here.

Dr. COOPER. Thank you, sir.

Senator THURMOND. Dr. Cooper, would you agree with the requirement expressed by General O'Neill of the technical and analytical support for the SDI program?

Dr. COOPER. Yes, I do, sir. As you well know, I was the midwife in the creation of the Strategic Defense Initiative program for Secretary Weinberger. I felt from the beginning that some capable scientific and technical organization should have been created and attached to the Strategic Defense Initiative Organization from the beginning. I regret the fact that we're three years down the road and we still don't have that quality advice for General Abrahamson, which he desperately needed when he started and even more desperately needs now.

Senator THURMOND. Dr. Cooper, do you believe that your recommendation for independent funding might result in the SDII being a distracted partner?

Dr. COOPER. I think that independence is, and it's been my experience in the past that this is the case, is completely a matter of funding. That is, it is virtually impossible for the director of an organization which has only one sponsor to be fully independent, to really give independent advice or to take independent action when he can see that there are things that are being done that are ill-advised.

And so, that really is at the basis of my recommendation to you that you strongly consider a line item in the budget which is separate from the SDIO organization funding and which is stable over long periods of time and which can be used to support general research in the SDI Institute, if that's the direction that the Congress chooses to go.

Senator THURMOND. Dr. Cooper, how essential is your belief that the FFRDC be attached to a university? Do you have in mind an arrangement like the University of California and the Department of Energy National Weapons Laboratory?

Dr. COOPER. I think that would be an entirely appropriate relationship. What it does inside of the organization is it gives an aura to that organization which makes it more acceptable in the scientific and engineering community to remain attached.

It also solves the issue which I know is on Senator Levin's mind, or he's asked several questions about, of compensation levels and how they're set, because the compensation levels are set and tend to be related to compensation levels on the campus, which are higher than government compensation levels and yet, much lower than you would find perhaps in the aerospace industry and in other commercial settings.

And so, they give added flexibility to attract good people, and yet, they hold in check the unrestrained increases that one might expect if very high compensation limits were set.

Senator **Thurmond**. Dr. Cooper, are there examples of existing FFRDCs where a percentage of the scientists and engineers do hands-on research?

Dr. **Cooper**. Yes. I would say that of the number that were discussed earlier, that virtually all of them do some hands-on research. I would guess singular examples, counter-examples to that might be CNA and IDA. There's essentially no real hands-on laboratory research. But they tend to serve masters whose end goal is not hardware.

And so that's why my recommendation was that if the end goal of the primary sponsor of an organization is to master some advanced hardware that incorporates engineering and scientific disciplines as the major factor in decisions about how to build that hardware, which way to go in terms of advanced systems, that you have a substantial laboratory hands-on effort in that.

Examples of organizations like that are organizations like Livermore and Los Alamos, Lincoln Laboratory, Jet Propulsion Laboratory.

Senator **Thurmond**. Thank you, Dr. Cooper. Thank you, Mr. Chairman.

Senator **Levin**. Thank you very much, Senator Thurmond.

Just one more question about that primary research which Senator Thurmond asked you about, which you're recommending so strongly.

Do you believe that an FFRDC which did hands-on research would be better able to attract top talent than one that merely evaluated other people's research?

Dr. **Cooper**. I believe that that's an absolute prerequisite. If you want to attract and retain the more talented engineers and scientists in the community, you must have a laboratory research capability in the key disciplines that are represented in the lab.

Senator **Levin**. Okay. If you're willing, we might have additional questions for you for the record.

We will also include in the record a number of reports and statements—the CRS report on SDII, the statement by the Union of Concerned Scientists and Common Cause, because there was no time to hear from them orally—they'll also be made part of the record.

A number of us may be submitting questions to a number of witnesses for the record. And, again, we're deeply indebted to you for your patience here and you're being able to join us this afternoon. Thank you so much.

We'll stand adjourned.

Dr. **Cooper**. Thank you, Mr. Chairman.

[Whereupon, at 5:20 p.m., the subcommittees were adjourned.]

ADDITIONAL MATERIAL SUBMITTED FOR THE RECORD

PREPARED STATEMENT OF BRIGADIER GENERAL MALCOLM O'NEILL

Thank you for the opportunity to appear before you today, Mr. Chairmen, to discuss what I consider to be an extremely important topic -- a Federally Funded Research and Development Center (FFRDC) for the Strategic Defense Initiative. This is not a new subject, as you are well aware, but I would like to review the requirement for the FFRDC.

The mission of the Strategic Defense Initiative Organization (SDIO) is to objectively assess technical questions relating to strategic defense in order to provide the President and the Congress with the necessary information to reach a national decision on strategic defense. This includes conducting a long-range, directed research program toward what may be an extremely complex and far-reaching system. The requisite research is likely to be correspondingly complex. Programs must be carefully crafted to strike the right balance among pure research, applied experiments, development of research results, and feasibility demonstrations.

The SDIO does no research itself; it is the managing agent for the SDI research program. By itself this is a significant task. A great variety of individual, parallel research efforts must be directed and coordinated to produce integrated results. A common data base must be maintained to avoid unnecessary overlap or duplication of efforts, and to facilitate cross-information between research projects. In addition, design development and definition of the system architecture requires ongoing, continuous study and analysis, including cost, technology, and performance trade-offs among system elements.

The SDIO requires technical support in these areas to properly carry out its SDI program management functions. The accelerating rate of research and the evolution of the Program require that the SDIO focus on actual program management, and that the necessary technical support, systems integration, and program evaluation and analysis be provided on a long-term, continuous, conflicts-free basis rather than in a piecemeal, ad hoc manner. There is an immediate need for continuous access to the highest quality engineering and scientific talent to provide dedicated support to the SDIO.

On 1 March 1986, the Department of Defense completed an evaluation of the alternatives for satisfying the requirements. The alternatives examined were:

o Government organizations, including expansion of the present SDIO staff; a military service organization, or a new DoD field agency.

o For-profit firms, including large industrial firms; small-to-midsize System Engineering and Technical Assistance (SETA) contractors; or a new consortium of such firms or contractors, either U.S. or foreign.

o Non-profit firms, including existing Federally Funded Research and Development Centers; a new division within an existing FFRDC; a new FFRDC; universities; and private not-for-profit laboratories/corporations, new or existing.

The results of the evaluation can be summarized as follows:

o The use of a government organization to provide the special technical support needs of the SDIO was found to be undesirable because: (1) it would be difficult to attract, retain, and manage the required number of highly qualified scientific and engineering personnel; and (2) the needed personnel buildup could not occur or respond in sufficient time to meet changing requirements.

o The use of for-profit firms was found to be undesirable because of the conflicts of interest inherent in the for-profit organization, the probable inability to ensure total objectivity and independence of thought; and the negative business impact on such a firm through its necessary dedication to SDIO technical support alone; and the inability to guarantee access to industry proprietary information.

o Of the various not-for-profit alternatives examined, a new FFRDC ranked highest. The FFRDC mechanism was considered to offer quick, responsive handling of SDIO needs, while allowing considerable freedom in establishing salary structures and a working environment conducive to attracting scientific and engineering talent. While an existing FFRDC or other non-profit organization could, potentially, provide capabilities and staff more readily, none have the breadth of specialized expertise to undertake major SDI technology program review and oversight. Any existing organization, including an existing FFRDC or national laboratory, will necessarily have ongoing work and a deeper background in one technology or another. In addition, no existing organization is in a position to offer the desired degree of dedication to, and exclusive focus on, the SDI Program. Establishing a new FFRDC, specifically oriented to SDIO technical support needs, was found likely to result in greater responsiveness and support than attempting to reorient an existing FFRDC.

Establishing a new FFRDC, free from commercial ties and dedicated exclusively to the SDI technical functions, is the best alternative to meet that requirement. Accordingly, the Defense Department moved to create a new FFRDC--to be called the Strategic Defense Initiative Institute (SDII)--with funds appropriated for the SDI Program. Originally, the goal for initial operation of the SDII was the end of FY 1986. The SDIO announced its intent to establish a new FFRDC in the Federal Register and the Commerce Business Daily with three sets of announcements over a 90 day period ending June 16, 1986.

As the DoD moved to create the SDII, questions about the decision to establish a new FFRDC surfaced. The SDIO, in response to letters to the SDIO Director, answered questions and addressed issues in several information briefings to professional and personal staff of the Congress, and continues to provide full disclosure of information about the need for and intended mission of the new FFRDC.

Because of these issues, the DoD was cautioned against proceeding further to establish the new FFRDC by the end of 1986. Subsequently, legislation was enacted in the FY 1987 DoD Authorization Act and the Continuing Resolution prohibiting the new FFRDC until authorized with funding appropriated in separate legislation. Further, both the DoD and the Comptroller General were directed to provide detailed reports on the issues.

At the request of certain members of Congress, the Congressional Research Service (CRS) examined the actions to establish the FFRDC and reported (30 May 1986) pros and cons of the initiative. The central conclusion of the CRS report stated:

"Given DoD's stated mission (of technology evaluation and system integration), desired organizational characteristics (of being competent, continuous, and conflicts free), and institutional constraints (especially their purposed inability to hire qualified people in-house), the decision to establish a new FFRDC is consistent."

The Comptroller General evaluated (report dated 17 November 1986) the options and plans for SDI technical support. The Comptroller General's findings are entirely supportive of the selection of a new FFRDC to perform the needed technical support, ranking that option as first among eight alternatives in terms of effectiveness. (Tied for effectiveness with establishing a new FFRDC was a new division within an existing FFRDC/national laboratory, although many of the GAO sources offered disadvantages with that alternative.)

In response to draft legislation precluding establishment of the FFRDC until a full DoD report was prepared, a comprehensive report of alternatives was provided to the House and Senate Armed Services Committees on 8 August 1986. A full cost comparison analysis was completed and provided as a supplement to the report to the two Committees on 20 October 1986. Most recently, the DoD submitted to the Congress, on February 25, 1987, a complete report to satisfy all known questions and issue regarding the establishment of the FFRDC.

The SDII will be a systems engineering/systems integration group. The SDIO will retain all management and decision responsibility for the SDI Program. The SDII is being established for a very specific purpose--to provide scientific and technical support to the SDIO for evaluating and integrating research. The SDII is not to perform any oversight or policy functions. Those functions, in whole or part, are the role of other organizations, including the Congress.

To meet these technical support needs and provide the SDIO with objective, conflicts-free advice, we remain convinced that a new organization exclusively dedicated to these narrow functions is absolutely essential. We feel that reports by the Congressional Research Service and the Comptroller General support our responses to the criticisms and issues raised about our course of action for a new FFRDC.

Mr. Chairmen, I submit that we have a valid requirement, we have studied the alternatives to satisfy the requirement, and we have selected the prudent decision. We have tried to be open and candid, and to provide to the Congress complete information on every occasion. We need to move ahead with actions to establish the new FFRDC as its need is immediate. I ask the support of these Committees for the authorizing and appropriating legislation to allow us to proceed. This completes my opening statement and I welcome your questions.

JOHN GLENN, OHIO, CHAIRMAN

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SAM NUNN, GEORGIA
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United States Senate
COMMITTEE ON
GOVERNMENTAL AFFAIRS
SUBCOMMITTEE ON
OVERSIGHT OF GOVERNMENT MANAGEMENT
WASHINGTON, DC 20510-6250

May 15, 1987

General Malcolm O'Neill
Strategic Defense Initiative Organization
Department of the Defense
The Pentagon
Washington, D.C. 20301-1155

Dear General O'Neill:

Thank you for your testimony on May 6, 1987, at the joint hearing concerning the need for and operation of the proposed Strategic Defense Initiative Institute (SDII). We appreciate your being able to participate on such short notice.

We have several additional questions which we would appreciate your answering for the record. A list is attached to this letter. If possible, we would appreciate your responses by May 22, 1987.

If you need additional information, please have your staff contact Elise J. Bean at 224-3682 or Robert Bott at 224-9349. Thank you again for your assistance in this important matter.

Sincerely,

Carl Levin
Carl Levin
Chairman
Subcommittee on Oversight
of Government Management

J. Exon
James Exon
Chairman
Subcommittee on Strategic
Forces and Nuclear Deterrence

CL:JJE:ejb

POSTHEARING QUESTIONS TO SDIO

ON THE NEED FOR AND OPERATION OF THE PROPOSED STRATEGIC DEFENSE INITIATIVE INSTITUTE (SDII)

1. Please indicate whether SDIO intends to possess veto authority over the president of the proposed SDII.

2. Please indicate whether SDIO intends to possess authority to require senior staff persons in the proposed SDII (below the level of the SDII president) to be "acceptable to the SDIO Director."

3. Please indicate whether, in compliance with laboratory recommendations by the White House Science Council's Federal Laboratory Review Panel, DOD is willing to guarantee that at least 5 percent and perhaps as much as 10 percent of the total funds provided to the proposed SDII will be available for independent research by the SDII staff.

4. Please indicate whether DOD is willing to issue the contract to manage the proposed SDII on a competitive basis.

5. Please indicate whether DOD is willing to subject at least the best three proposals it receives to manage the proposed SDII to peer review by persons outside the federal government, with instructions to evaluate the proposals for the extent to which they foster competent, objective scientific advice.

6. In the annual report to Congress filed by SDIO in April 1987, Appendix E describes SDIO's plans for the proposed SDII. During the hearing on May 6, 1987, General O'Neill testified that this report incorrectly describes SDIO's position on several key issues related to SDII; he also testified that SDIO had changed its position on the staff selection issue "last summer." Please identify exactly which SDII-related issues SDIO changed its position on "last summer"; the basis for its decisions; who participated in the decisionmaking process; and why these changes were not incorporated in the April 1987 annual report. Also, please produce any documents associated with or which record the decisions taken last summer to change SDIO's positions on these matters.

7. On May 4, 1987, a member of the SDIO staff assisted the Oversight Subcommittee staff in obtaining a current list of the members of the Board of Trustees of the nonprofit corporation called the Strategic Defense Initiative Institute. To the best of your knowledge, please identify all past members of this Board, since the corporation's inception in 1986.

8. The proposal submitted by the nonprofit corporation to manage the SDII, if it is created, proposes an annual salary of $225,000 for the SDII president and an average annual salary of $110,000 for the next tier of senior staff. What is the general position of SDIO concerning the salaries of persons who would work for the SDII; would SDIO approve salaries in the proposed range; how much control is SDIO permitted to exert over the salaries actually established at the SDII; and how much control does SDIO intend to exert?

9. During the hearing, General O'Neill testified that it would be difficult to prevent persons working for SDIO to transfer to the proposed SDII to obtain the larger salaries offered there. Would SDIO support a statutory or administrative provision to prohibit persons who leave the SDIO from working for the proposed SDII for a period of one or two years?

10. It was revealed during the hearing that some individuals on the SDI Advisory Committee who participated in the original recommendation to DOD to create the SDII are now on the Board of the corporation who will probably be asked to operate the SDII, and are also eligible to serve as the highly paid officers of that institute. In light of this situation, would SDIO support a statutory or administrative provision to prohibit SDIO Advisory Committee members from participating in the SDII?

DEPARTMENT OF DEFENSE
STRATEGIC DEFENSE INITIATIVE ORGANIZATION
WASHINGTON, DC 20301-7100

MAY 28 1987

Honorable Carl Levin
Chairman
Subcommittee on Oversight of
  Government Management
Committee on Governmental Affairs
United States Senate
Washington, D.C. 20510-2201

Dear Senator Levin:

This is in response to the letter of May 15, 1987 from you and Senator James Exon, Chairman, Subcommittee on Strategic Forces and Nuclear Deterrence, Senate Committee on Armed Services, forwarding questions for the record on the need for and operation of the Strategic Defense Initiative Institute. Enclosed are responses following the order set out in the list attached to the May 15 letter.

We appreciate the opportunity to explain SDIO's critical need to establish and begin operation of the SDII and trust you will find the enclosed information responsive to your questions.

An identical response has been provided to Senator Exon.

Sincerely,

Malcolm R. O'Neill

Malcolm R. O'Neill
Brigadier General, USA
Deputy for Programs
 and Systems

Enclosures--2

SDIO RESPONSES TO QUESTIONS ON THE NEED FOR AND OPERATION OF THE PROPOSED STRATEGIC DEFENSE INITIATIVE INSTITUTE

1. The relationship between SDIO and the SDII is envisioned to be long term, i.e., five years in accordance with Office of Federal Procurement Policy. Because of the length of the commitment, assurance that the SDII President is capable of executing the demanding technological and managerial responsibilities of that position is extremely important to SDIO. While approval would give more assurance, the Director, SDIO has agreed to seek only review and comment authority for the position of President, SDII.

2. SDIO does not intend to possess authority to require senior staff persons in the SDII to be acceptable to the SDIO Director. SDIO apologizes for the confusion on this point caused by the second sentence, Section (6), Appendix E of the April 1987 Report to Congress on the SDI. The SDIO position is accurately stated in section (9) of the Secretary of Defense's Report to the Committees on Armed Services of the Senate and House of Representatives dated February 25, 1987. Except for the second sentence, section (6) of Appendix E is substantially identical to section (9) of the February report, including the statement that:

> The SDIO intends only to seek review and comment authority for other organization officers and senior technical director's of the FFRDC's staff.

Appendix E was copied from an earlier draft of the Secretary's report. Page 31 of the November 1986 GAO report also states this clarification of the SDIO position. Attached are copies of Section (6) of Appendix E, Section 9 of the Secretary's February report and 31 of the GAO report.

3. With respect to independent research, as stated on page 19 of the Secretary's February report, SDIO agrees that the ability to initiate related research and studies is valuable. We intend to provide contract provisions authorizing independent research by the SDII and will arrive at an appropriate amount through proposal evaluation and negotiation.

4. In his February 1987 report, the Secretary described the process by which he invited several prominent scientific and technical individuals to submit a proposal for operation of the SDII. The evaluation performed for GAO by consultants was evenly divided as to whether this approach would compromise the independence and objectivity of the contractor chosen to provide technical support to SDIO.

In addition to determining the qualifications of these individuals to be unique, the Secretary further determined that the time involved for full formal procurement would exceed the immediate need for technical support to the SDIO. The immediacy of that need is now accentuated as SDIO begins facing critical system level design and integration issues. SDIO believes that a competitive solicitation process would result in further delay without any substantive change in the number of qualified sources. As summarized on pages 8 and 9 of the Secretary's February 1987 report, SDIO's intent to establish a dedicated FFRDC has been widely publicized in the Commerce Business Daily, the Federal Register and in numerous trade publications. Respondents to SDIO's announcements have been assured that all proposals will be fully and fairly considered. SDIO has still not received any proposal other than that submitted by SDII. Given this experience, it is difficult to foresee the likelihood of a new solicitation for proposals producing any different result.

SDIO has satisfied the requirements of both the Federal Acquisition Regulation and the OFPP Policy for establishing an FFRDC. Dr. Cooper, in his testimony on May 6, 1987 acknowledged that, in his judgment, the method of soliciting proposals would be the personal invitation of the Director, SDIO to selected scientific personnel to take steps to establish a FFRDC. That would essentially duplicate what the Secretary has already done. Under these circumstances, a new solicitation is not warranted.

5. With respect to peer review, evaluation of any proposal to establish and operate the FFRDC requires knowledge of the technical requirements of the SDI program. The SDIO is not only the organization that has experienced the needs of the program, it is the organization that is ultimately accountable for management of the SDI program. While nine of the consultants surveyed by GAO thought some type of peer review of the proposal(s) would enhance credibility of the review, all agreed that SDIO needed to be involved in the process and no consensus emerged on organizations that should comprise a peer review group.

The Defense Science Board has recently established a panel to review and examine the SDI program independently of the SDIO for the Under Secretary of Defense, Acquisition. With the exception of Dr. Robert Everett, retired president, Mitre Corporation, the members of that panel have no association with the proposed SDII. While SDIO must retain ultimate evaluation authority, SDIO will request the Under Secretary to use the services of his advisory panel, minus Dr. Everett, or a panel of comparable stature and knowledge of the program, to review the proposal. SDIO will give significant weight to any recommendations provided by this review group.

6. On August 8, 1986, in response to provisions in the Senate Armed Services Committee FY 1987 Report on Defense Authorizations, the Secretary of Defense provided a report to the Committee regarding the proposed FFRDC dedicated to the SDIO. In response to similar provisions included in the Department of Defense Authorization Act, Fiscal

Year 1987 the Secretary submitted a report to the Senate and House Armed Services Committees on February 25, 1987. The August 1986 report states that the heads of SDII's several technical directorates must be acceptable to the Director, SDIO. The February 1987 report does not include that provision. SDIO has an urgent need for the technical support to be provided by the SDII. SDIO has provided substantial information regarding the processes followed in attempting to establish the SDII and is aware of issues raised in reports on the process provided to the Congress by reviewing organizations. These reports are reviewed by the SDIO staff under the guidance of Brigadier General Malcolm O'Neill, Deputy Director For Programs and Systems. Based on these reviews the SDIO staff recommended modification of the August 1986 position on acceptability to SDII technical directors. The Director, SDIO accepted this modification as part of the ongoing review of the status of the proposed SDII. As noted in response to Question 2, above, Appendix E to the April report mistakenly relied on a draft prepared before the report sent to the Armed Services Committees on February 25, 1987.

To the best of General O'Neill's recollection, the only other issue discussed at the May 6, 1987 hearing in which he indicated a change in the SDIO position, is the issue of including funding for independent research in the SDII sponsoring agreement. The position of SDIO is as stated in the August 1986 report, the draft picked up in Appendix E and the February 1987 report, i.e., SDIO cannot commit in advance to any fixed portion of the SDII budget be in devoted to independent studies. We agree that some flexibility will be built into the Institute, and we will explore contract provisions in negotiation towards that end. SDIO recognizes that the ability of the Institute to conduct independent research is perceived as a measure of its overall independence and objectivity. SDIO believes, however, that from a sound business perspective, it is imprudent to announce a commitment to any amount of funded independent research before receiving and evaluating a proposal from the Institute. General O'Neill's remark on this point reflects that, in its ongoing monitoring of the status of the SDII, SDIO staff discussions have indicated a stronger willingness to include a fixed amount for independent research.

7. To the best of SDIO's knowledge, the Trustees of the SDII are those individuals identified as trustees in the SDII proposal furnished to the Oversight Committee staff, except Dr. James Fletcher, who resigned when appointed Administrator of the National Aeronautics and Space Administration.

8. SDII's proposal is no more than an offer by the Board of the non-profit corporation submitted for consideration by the SDIO. SDIO's position on SDII salaries will be determined through the contract price negotiation process. The SDII must demonstrate that proposed salaries meet cost reasonableness criteria of the Federal Acquisition Regulation. Specifically, SDIO expects that prior to commencement of contract price negotiations, SDII will describe the duties of the positions of SDII president and senior staff, identify comparable compensation for similar duties and responsibilities and

potential specific candidates for these positions, giving due deference to the SDII's independent selection of officers. This information

will be audited and the results of the audit will be incorporated in SDIO's negotiation position. If the amount paid for compensation out of federal funds exceeds the annual rate of basic pay authorized (without regard to any limitation on the payment of such pay) for level II of the Executive Schedule under 5 U.S.C. 5313, the amount(s) paid and detailed statement of reasons for such payment will be reported to the Congress in accordance with the requirements of 10 U.S. C. 2359.

9. SDIO employees are subject to several existing statutory limitations on post employment activities of Department of Defense personnel. These limitations extend to potential post employment opportunities with the SDII. SDIO would not support any statutory or administrative provision that singled out SDIO employees for post employment restrictions.

10. The SDII by-laws do provide that officers may be appointed from within as well as without the Board of Trustees. It is SDIO's understanding that no member of the founding Board of Trustees intends to be appointed as an officer. To provide added assurance, SDIO will include in the sponsoring agreement with the SDII a provision precluding founding members of the Board from being appointed as officers.

from the reviewing contractor and its agreement to safeguard proprietary information. The SDIO intends to require that this practice be followed by the SDII as well.

> (6) Whether or not the sponsoring organization will have any role or influence in the selection of the staff of the proposed Federally Funded Research and Development Center below the head of such center and what that role or influence, if any, will be.

There will be no SDIO participation in search, screening, or selection of SDII management or staff. The sponsoring agreement will require only that the Institute's president and the heads of its several technical directorates be acceptable to the SDIO Director. Specifically, concurrence will be required by the SDIO Director for the top-level executive (e.g., president) of the FFRDC, and coordination with the appropriate peer directors will be required in the selection of the key FFRDC technical personnel. The SDIO will not have veto power over the FFRDC's staff selection except for that of president. The SDIO intends only to seek review and comment authority for other organization officers and senior technical directors of the FFRDC's staff.

Such approval of the handful of key FFRDC personnel is neither new nor unusual. For example, the agreement between the Center for Naval Analysis (CNA) and its sponsoring agency, the U.S. Navy, provides that the Center's president and other top officers, including the directors of its various operating divisions, be subject to approval of Navy representatives. Other FFRDCs also routinely subject their president to the approval of the sponsoring government agency.

The SDIO does not believe such a limited role will in any way adversely impact either the objectivity or the independence of the SDII. The SDIO, as the sponsoring government agency of the SDII, has a duty to ensure fully qualified key personnel for the Institute. To carry out properly its technical support duties owed to corporate bodies by directors should in themselves prevent real conflicts, we need to include provisions that preclude even the appearance of conflicts. As set forth above in more detail, members of the governing board will be prohibited from holding senior operating positions with private contractors and from participating in center matters that could be perceived as conflicting with their private financial interests.

"(8) Whether other actions will be taken to avoid possible conflict of interest situations within such center."

Regarding post-employment practices, as a non-government organization, an FFRDC is not legally subject to the post-employment restrictions that apply for federal employees. Upon additional investigation and inquiry of counsel, I have been further advised that it would not be appropriate to attempt to impose so-called "revolving door" provisions on FFRDC employees for several additional reasons, including the following:

(a) "Revolving door" restrictions applicable to government employees are enforceable under federal criminal statutes that include provisions for financial penalties and imprisonment. We could not include these sanctions in a contract.

(b) Assuming the FFRDC contractor would agree to "revolving door" provisions in its contract with the government, it would then have to enter into employment contracts with its employees, imposing future employment limitations. These types of limitations have been found to be of questionable enforceability under general principles of contract law, as well as specific state statutes.

(c) Aside from questions about their specific enforceability, provisions limiting future employment are likely to inhibit recruitment of personnel possessing the highest level of relevant expertise.

Concerns in this area appear related to potential involvement of the SDII in review of research proposals. However, SDII functions will be primarily oriented to evaluating research results. When government activities do require the service of a contractor to review proposals submitted by private concerns, it is the general practice to obtain financial disclosure statements from reviewing contractor personnel and their agreement to safeguard proprietary information. We intend to require that this practice be followed as well by the SDII.

"(9) The role of the Department of Defense in (a) the selection of the staff of the center; and (b) the internal organization of such center."

The Director of SDIO will require concurrence of the staff selection for the top level executive (e.g., president) for the SDII and coordination with the appropriate SDIO peer directors in the selection of key SDII technical personnel. It will not exercise veto power over the SDII's staff selection except for that of president. SDIO intends only to seek review and comment authority for other organization officers and senior technical directors of the FFRDC's staff.

Such approval of the handful of key FFRDC personnel is neither new or unusual. For example, the agreement between the Center for Naval Analysis (CNA) and its sponsoring agency, the U.S. Navy, provides that the Center's president and other top officers, including the directors of its various operating divisions, must be subject to approval of Navy representatives. Other FFRDCs also routinely subject their president to the approval of the sponsoring government agency.

We do not believe such a limited role will in any way adversely impact either the objectivity or the independence of the SDII. SDIO, as sponsoring government agency of the SDII, has a duty to take minimal care to ensure fully qualified key personnel for the Institute. In order properly to carry out its technical support mission, it is imperative that SDII personnel possess the highest professional qualifications, and that there be effective communication and liaison between top management of the two organizations. That is the only purpose of such provisions.

There has also been some criticism that the SDII is planned to have a "mirror image" structure to the SDIO, in that it should be divided into technical elements (e.g., directed energy, kinetic vehicles) to correspond to those of SDIO. However, this is only a suggestion. As an independent entity, the SDII can structure itself any way it wants. It simply makes good sense, given the close working relationship and the need for effective liaison between the two organizations, to set up in this way.

"(10) Whether a prescribed minimum percentage of the annual budget of such center will be set aside for research to be conducted independently of the Department of Defense."

We agree that the ability to initiate related research and studies is valuable and should be explored. While we cannot commit in advance to any fixed portion of the SDII budget being devoted to independent studies, we agree that some flexibility will be built into the Institute, and we will explore contract provisions in negotiation towards that end.

that DOD would consider fully and fairly any proposals that were received.

Review of Proposal(s)

SDIO plans to be the sole body to review proposals to operate the new FFRDC. SDIO currently has no plans to enlist peer review by persons outside the government in this review process. According to the Secretary of Defense, SDIO has the appropriate resources and personnel to best evaluate proposals to operate the Institute. The SDIO Deputy Director for Programs and Systems will chair an evaluation board consisting of SDIO Technology Office Directors. The Secretary's report to the Senate Committee on Armed Services noted that, if additional outside review were needed, it would be considered at that time.

Staff Selection

SDIO originally planned to prepare a sponsoring agreement between itself and the new FFRDC that would require the Institute's president and the heads of its technical directorates to be acceptable to the SDIO's Director. The Secretary noted that such approval of key FFRDC personnel is neither new nor unusual and cited the agreement between the Center for Naval Analyses and the U.S. Navy as a precedent.

The Secretary stated that such a role would not adversely affect either the objectivity or the independence of the Institute. He added that to carry out its technical support mission properly, the Institute's personnel must possess the highest professional qualifications and that effective communication and liaison between top management of the two organizations must exist. The approval provisions are meant to ensure this purpose, according to the Secretary.

The Secretary of Defense's Special Assistant for the Institute subsequently clarified DOD's position by noting that the Director of SDIO would require SDIO's concurrence on the selection of the Institute's top level executive—the president—and coordination with the appropriate SDIO peer directors in the selection of key Institute technical personnel. SDIO would exercise veto power over only the Institute's selection of the president. SDIO intends to seek only review and comment authority for other organization officers and senior technical directors of the FFRDC's staff.

Work Plan Approval

SDIO proposes that the Institute submit its work plans every 6 months for SDIO's approval. The Secretary noted that this requirement is reasonable in that it ensures that the FFRDC fulfills its stated purpose, meets the

THE SECRETARY OF DEFENSE
WASHINGTON, THE DISTRICT OF COLUMBIA

5 MAR 1986

General Bernard A. Schriever, USAF (Ret)
Schriever and McKee, Inc.
2000 N. 15th Street
Suite 707
Arlington, Virginia 22201

Dear General Schriever:

Thank you for your presentation on 7 January 1986 regarding a support organization for the SDIO. The scope and complexity of the SDI mission surpass prior Department of Defense program undertakings. I am persuaded that the SDIO needs support from the best technical and scientific talent available in the nation. The need is immediate. Attached is a Mission Statement which identifies the need.

I have reviewed possible approaches to obtaining the necessary support both from within the government and from a variety of nongovernment sources. I believe that establishment of a Federally Funded Research and Development Center (FFRDC) offers the best prospect of meeting SDIO needs in a timely manner.

I believe that the individual members of the SDI Advisory Committee possess the requisite expertise and understanding of national defense issues generally, and the particular insights into the needs of the SDI program, that make them uniquely qualified to take the initial steps necessary to result in formation of a technical organization that could meet the broad scientific support needs of the SDIO.

Accordingly, I would welcome and encourage them to undertake these steps as quickly as possible, to lead to the formation of such an organization as an FFRDC, and submission by it of a contract proposal. To this end, I anticipate that they will be contacting individuals with the outstanding experience necessary to manage and staff such an organization, and providing the required advice to encourage their formation of such a support organization. As you have noted, such individuals must be free of any actual or apparent conflict of interest with the responsibility to provide dedicated and objective support to the SDIO program.

The Department of Defense cannot, of course, commit to such an organization until both it, and the indicated contract proposal, are actually evaluated. I have every reason to believe, however, that you will be able to take the steps that will lead to the formation of an organization that is uniquely qualified to meet this highly specialized requirement.

Identical letters are being sent to all individual members of the SDI Advisory Committee.

Sincerely,

Attachment

1986 MAR 21 PM 2:50
OFFICE OF
THE SECRETARY OF DEFENSE

BERNARD A. SCHRIEVER
SUITE 707
2000 NORTH FIFTEENTH STREET
ARLINGTON, VIRGINIA 22201
703 243-3998

18 March 1986

The Honorable Casper W. Weinberger
Secretary of Defense
Room E 880
The Pentagon
Washington, D.C. 20330

Dear Mr. Secretary:

I am very pleased to have received your letter of 5 March concerning the establishment of FFRDC to enhance SDIO's overall management capabilities.

Dr. Seitz has been out of town so I have not had an opportunity to discuss details with him as yet. However, certain actions are already underway and by the time you receive this letter General Abrahamson will have submitted the names of people whom we believe can act as Board Members to get the project successfully launched.

You can be assured that all of us on the SDI Advisory Committee will do everything possible to make this effort a success.

Sincerely,

B. A. Schriever
General USAF (Ret.)

THE STRATEGIC DEFENSE INITIATIVE INSTITUTE
1215 Jefferson Davis Highway
Suite 405
Arlington, Virginia 22212

JUN 13 1986

June 10, 1986

Lt. General James A. Abrahamson
Director
Strategic Defense Initiative Organization
Washington, D.C. 20301-7100

Dear General Abrahamson:

I enclose for your evaluation a contract proposal to provide a technical support organization for the SDIO in the form of a Federally-Funded Research and Development Center ("FFRDC"). This proposal was developed by the Trustees of The Strategic Defense Initiative Institute ("SDII") at the encouragement of the Secretary of Defense.

SDII is a nonprofit corporation incorporated in the District of Columbia with its principal office in Crystal City in close proximity to the Pentagon. SDII was formed exclusively to provide dedicated, conflict-free, and objective support to SDIO. SDII is directed by a Board of Trustees of exceptional talent and broad experience who are already engaged in a nationwide effort to recruit the best available management and technical personnel to staff The Institute.

The proposal I submit to you today seeks to establish SDII as SDIO's FFRDC. Under this proposal, SDII will work closely and responsively with SDIO in the accomplishment of its mission. The precise nature of that relationship, however, is not definitively set forth in the proposal. Of course, SDII, as an FFRDC, would be subject to OFPP Policy Letter 84-1 of April 1984, but SDII must remain an independent private organization with its staff reporting to the officers and Trustees of SDII.

Accordingly, I recommend that after issuance of a letter of intent immediate steps be taken by us jointly to draft a memorandum of understanding to formalize the SDIO-SDII relationship. This should include an advance agreement on the mechanism by which work is to be initiated, evaluated, and implemented. SDII cannot and will not merely provide personnel augmentation to SDIO. SDII intends, rather, to supply definable "products" to the SDIO. This is only possible, however, if we enter into a memorandum of understanding as contemplated by Policy Letter 84-1's Section 6c.

If this proposal meets with your approval, I urge that the following steps be taken. First, a letter of intent should be issued by SDIO within thirty days. Such a letter of intent will allow the disbursement of initial funding and the utilization by SDII of its established line-of-credit. Second, after negotiation of final terms, this letter of intent should be replaced by award of a 5-year, cost-reimbursement plus fixed fee contract to SDII within sixty days after issuance of the letter of intent. Finally, based upon our negotiations leading to award of the contract, a memorandum of understanding should be jointly drafted to formalize the nature of the SDIO-SDII relationship.

I look forward to your response to this proposal. SDII stands ready to provide any further information you may require to evaluate the proposal. SDII is well aware of the unprecedented scope and complexity of the SDI Program and is eager to be a part of this critical national challenge by assisting SDIO.

Very truly yours,

General B. A. Schriever, USAF (Ret.)
Chairman
Board of Trustees
The Strategic Defense Initiative Institute

Enclosure

Delivered by hand.
Bez

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May 4, 1987

WRITER'S DIRECT DIAL NUMBER
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OUR FILE NUMBER
C 88303-0000-2

HAND DELIVERY

Ms. Elise Bean
c/o Senator Carl Levin
Room 442
Hart Senate Office Building
Washington, D.C. 20510

Dear Ms. Bean:

Enclosed, per your request, is a list of the Board of Trustees of The Strategic Defense Initiative Institute.

Please feel free to call me if you have any further questions in this regard.

Very truly yours,

Terence P. Ross

Terence P. Ross

Enclosure

THE BOARD OF TRUSTEES OF THE STRATEGIC DEFENSE INITIATIVE INSTITUTE

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4/7/86

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PREPARED STATEMENT OF HARRY R. FINLEY

Mr. Chairmen and Members of the Subcommittees:

I am pleased to be here today to discuss GAO's report on the Department of Defense's (DOD's) proposal for establishing a new federally funded research and development center (FFRDC) to provide the Strategic Defense Initiative Organization (SDIO) with technical support. SDIO's plans for the new FFRDC, to be known as the SDI Institute, raised concerns within the Congress as to whether the proposed FFRDC would be independent and objective in accordance with government-wide policies.

BACKGROUND

DOD determined that SDIO needed to quickly augment its capability to assess technical questions regarding strategic defense. In November 1985, an ad hoc SDIO Technical Support Working Group was formed in response to a request from SDIO's Director to identify and assess possible organizational approaches for providing SDIO with technical support. The working group developed a list of characteristics considered essential for the support capability. Based on these criteria, the group evaluated eight possible organizational alternatives and concluded that the best option was to establish a new FFRDC. The other seven options were to establish a new division in an existing FFRDC or national laboratory; contract with an existing FFRDC or national laboratory; contract with a university; contract with a non-profit laboratory or corporation; contract with a for-profit firm; expand the present

SDIO staff; and establish a new DOD field or military organization.

According to DOD, the SDI Institute would support SDIO through technical evaluation and integration of existing and potential technological advances and system concepts. DOD's position on the Institute was contained in the Secretary of Defense's August 1986 report to the Senate Committee on Armed Services.

On August 4, 1986, the Senate Committee on Armed Services asked us to (1) evaluate alternative organizational approaches for providing SDIO with technical support, (2) evaluate the extent to which DOD's plans provided for an independent and objective FFRDC in conformity with government-wide policies for FFRDCs, and (3) determine whether there were any precedents for DOD creating a new FFRDC to provide technical support for a major research program. Subsequent to the Committee's request, the Congress passed the National Defense Authorization Act for Fiscal Year 1987. Section 213 (c) of the act required us to report, as appropriate, on certain matters concerning the proposed new FFRDC. Our report was prepared in response to both the Committee request and the legislative requirement.

To conduct our assessment, we obtained the views of a select group of individuals. We used this approach because (1) an evaluation of alternative organizational approaches can perhaps be best performed by individuals with experience and close familiarity with the organizations, (2) government guidelines concerning a FFRDC's independence and objectivity are broadly stated and do not provide specific criteria with which to measure DOD's plans, and (3) the views and experiences of individuals with knowledge of FFRDCs can provide insights on the acceptability of DOD's plans, given the absence of specific criteria. Our report is a compilation of views expressed by the select group of individuals contacted during our review.

We asked 11 consultants with broad governmental, military, industrial, and/or academic experience, but with no involvement with the SDI Institute proposal, to (1) evaluate the organizational options assessed by the SDIO working group, (2) rate the options in terms of DOD's criteria for providing SDIO with technical support, (3) rank the options according to effectiveness and cost, and (4) assess the impact on the FFRDC's independence and objectivity of DOD plans for evaluating proposals and selecting a contractor for the SDI Institute and for participating in staff selection.

In addition, we asked the heads of nine DOD-sponsored FFRDCs to express their views on the impact on the FFRDC's independence and objectivity of DOD's plans for staff selection, work plan approval, provisions for independent research, and conflict-of-interest and post-employment restrictions. Prior to meeting with the consultants and heads of the FFRDCs to discuss their views, we had them record their responses on questionnaires that we designed.

RATING OF ORGANIZATIONAL OPTIONS

The consultants concluded that the SDIO needs technical support to oversee research program and systems integration efforts. They agreed with the SDIO working group's overall effectiveness ranking of the top two and bottom two organizational options. The consultants assigned their highest overall rankings to the option of creating a new FFRDC and a new division in an existing FFRDC. These options tied for first. The consultants generally preferred the FFRDCs because of their proven records at (1) attracting high-quality personnel, (2) providing objective and independent assistance, and (3) safeguarding proprietary information.

The new FFRDC option scored especially well with the consultants on the criteria of independent, objective, and dedicated assistance. However, concerns were expressed about a new FFRDC: the time needed to establish it, the cost as compared to other organizations, and its ability to attract top quality people. A new division in an existing FFRDC was given high marks for its perceived ability to be established quickly and relatively less costly by drawing upon existing talent and infrastructure. However, several consultants expressed concerns about using an existing FFRDC: the current sponsors would probably not allow their FFRDCs to assume the SDI Institute mission, the assumption of the SDI mission could severely impair the FFRDC's current operations, and present work commitments would impair the existing FFRDC's responsiveness to SDIO.

The consultants ranked expansion of SDIO and creation of a new DOD/service group seventh and eighth, respectively, for overall effectiveness. The consultants' consensus was that SDIO and the new DOD organization would not be able to attract high-quality scientific and engineering talent because of low salaries and other Civil Service restrictions and would not be able to be established quickly and grow rapidly.

The consultants found it difficult to compare organizations on the basis of cost and selected no clear favorite as the least-cost organization. Most selected the for-profit firm as the highest cost option and scored the existing FFRDC, the expansion of SDIO's staff, a new division in a FFRDC, and a new DOD/service group as the first through fourth lowest cost options. They scored a new FFRDC as the third highest cost option. Cost was not a primary criterion for DOD's ranking of organizational options.

INDEPENDENCE AND OBJECTIVITY ISSUES

Contractor Selection

Using the Secretary of Defense's sole-source selection authority under the Competition in Contracting Act of 1984, DOD invited a group of individuals to submit a proposal for the establishment and operation of the Institute, rather than opting to engage in a competitive negotiation process. Any others wishing to submit proposals would be allowed to do so. Eight of the nine original contracts for the DOD-sponsored FFRDCs included in our review had been established by sole-source awards.

We asked the consultants to indicate which method--sole source or competitive selection--they believed would least compromise the independence and objectivity of the contractor chosen to provide technical support to SDIO. No consensus existed among consultants on this question. Three said that competition compromises independence and objectivity more than sole-source; four said that competition compromises less than sole-source selection; and three said that the impact of the selection methods on independence and objectivity is about the same.

Reviewing Proposals

DOD stated that SDIO, alone, would review any proposal received from prospective contractors interested in operating the SDI Institute. Although nine of the 11 consultants said that some kind of peer review of the proposal(s) is necessary to best guarantee the independence and objectivity of the Institute, there was no consensus on what organizations should comprise the review group. The consultants expressed the views that peer review would enhance the credibility of the review process, improve the quality of the proposal(s), and was necessary in the political climate of the SDI. We believe that the consultants' views in favor of peer review of proposal(s) have merit and deserve DOD's consideration.

Staff Selection

DOD, in its August 1986 report, stated that the Institute's president and heads of its technical directorates would have to be acceptable to the SDIO's Director. The Secretary of Defense's Special Assistant on the Institute told us that the SDIO's Director would exercise veto power over the selections. Subsequent to our discussions with the consultants, DOD stated that the Director would exercise veto power only over the selection of the Institute's president and that coordination with appropriate SDIO peer directors would be required in the selection of key Institute technical personnel.

We asked the consultants and heads of the nine FFRDCs for their views on whether SDIO's veto power over staff selection would compromise the independence and objectivity of the new FFRDC. The consultants were about evenly split, with five saying that it probably would not and six saying that it would or probably would. Three considered veto power over the FFRDC director acceptable; two would accept it to the technical director level; three said no veto power at any level would be acceptable; and one favored veto power down to an unspecified level. The other two consultants did not express strong views on this issue.

All nine heads of FFRDCs said that staff selection veto power would compromise independence and objectivity. Two considered sponsor veto power over a FFRDC's director acceptable, but none would advocate veto power over technical directors. Only one of the sponsors of the nine DOD FFRDCs has veto power and that power is limited to the selection of the president and vice-president.

Work Plans

DOD proposed that SDIO would review the Institute's work plan every 6 months. We asked the heads of the FFRDCs whether the necessity for a sponsor's approval of a work plan would compromise the FFRDC's independence and objectivity more than joint agreement on the plan. No consensus surfaced on this issue. All nine FFRDC directors agreed that work plans must be developed by mutual agreement and consultation between the sponsor and the FFRDC. Five FFRDCs negotiate work with their sponsors; three have annual work plans approved by advisory committees after sponsor/center interaction; and one has 1- and 5-year plans approved by its sponsor.

Provisions for Independent or Self-Initiated Work

DOD first said that it was not opposed to contract provisions that would permit the Institute the flexibility to initiate its own work proposals, but it would not commit a fixed percentage of the Institute's budget to such work. DOD later noted that SDIO would encourage the Institute to initiate related research that the Institute deems necessary and that SDIO would provide a level of funding for such work in future contract negotiations. Officials of all nine FFRDCs said that the guarantee of some level of independent research generally enhances independence and objectivity. Independent research permits the FFRDCs to do forward planning, to explore long-term problems, and to examine questions that the sponsors do not think of or want to ask. All nine DOD-sponsored FFRDCs have provisions for independent or self-initiated research.

Conflict-Of-Interest and Post-Employment Restrictions

DOD plans to address real or apparent conflicts of interest through SDIO's sponsoring agreement with the SDI Institute. For example, the sponsoring agreement would prohibit any SDI Institute employee, officer, or Board of Trustees member from holding any position with SDIO. The agreement would also prohibit more than one-half of the members of the SDI Institute Board of Trustees from simultaneously holding any position with the SDI Advisory

Committee, a not-for-profit consultative group of private citizens who make available their scientific and technical expertise to the SDI program. Moreover, in order to avoid any actual or apparent conflict-of-interest, DOD expects that persons who are members of both the Advisory Committee and the SDI Institute Board of Trustees would abstain from participation in any evaluation or advice by the Advisory Committee regarding the Institute. DOD intends no post-employment restriction on Institute employees.

All nine FFRDCs have conflict-of-interest provisions, but none has post-employment restrictions. The nine FFRDC heads did not believe that the absence of such restrictions would compromise the Institute's independence and objectivity.

FFRDCS ESTABLISHED TO SUPPORT MAJOR RESEARCH PROGRAMS

Some consultants and FFRDC officials told us that DOD's proposal to establish a new FFRDC for the SDI program is not unusual and that FFRDCs have been established to support programs, missions, or functions. For example, the Aerospace Corporation was established in 1960 to support the military space and advanced ballistic missile programs.

- - - - -

This concludes my prepared testimony. At this time, I would be happy to answer any questions you may have.

United States Senate
WASHINGTON, D.C. 20510

May 15, 1987

Mr. Harry R. Finley
Senior Associate Director
National Security and International Affairs
U.S. General Accounting Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Finley:

Thank you again for your testimony on May 6, 1987, at the joint hearing concerning the need for and operation of the proposed Strategic Defense Initiative Institute (SDII). We appreciate your being able to respond on such short notice.

Senator Warner would like your response to one additional question for inclusion in the hearing record: whether GAO has any reservations about the conclusions reached in GAO's study of the proposed SDII, based upon the approach undertaken in the study to examine issues related to the proposal, the instruments used to gather information, the number of consultants who participated in the study, or the backgrounds of these particular consultants.

Please provide your response to this question by May 22, 1987, if possible. If you need additional information, please contact Elise J. Bean at 224-3682 or Robert Bott at 224-9349. Thank you again for your assistance in this important matter.

Sincerely,

Carl Levin
Carl Levin
Chairman
Subcommittee on Oversight
of Government Management

J J Exon
James Exon
Chairman
Subcommittee on Strategic
Forces and Nuclear Deterrence

CL/JE:ejb

GAO
United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

May 22, 1987

The Honorable Carl Levin
Chairman, Subcommittee on Oversight
of Government Management
Committee on Governmental Affairs
United States Senate

The Honorable James Exon
Chairman, Subcommittee on Strategic
Forces and Nuclear Deterrence
Committee on Armed Services
United States Senate

Enclosed is our response to Senator Warner's additional question for inclusion in the record from the joint hearing on May 6, 1987, concerning the need for and operation of the proposed Strategic Defense Initiative Institute.

If you have any additional questions, please contact me on 275-4268.

Sincerely yours,

Harry R. Finley

Harry R. Finley
Senior Associate Director

Enclosure

ADDITIONAL QUESTION FROM SENATOR WARNER

Senator Warner asked whether GAO has any reservations about the conclusions reached in GAO's study of the proposed SDII, based upon the approach undertaken in the study to examine issues related to the proposal, the instruments used to gather information, the number of consultants who participated in the study, or the backgrounds of these particular consultants.

GAO RESPONSE TO QUESTION FROM SENATOR WARNER

The General Accounting Office has no reservations about the conclusions reached by the individuals in our review of the proposed Strategic Defense Initiative Institute (SDII). In order to respond to the request from the Senate Committee on Armed Services in a timely manner, we developed an approach, as agreed with Committee representatives, to obtain the views of a select group of individuals on the Committee's areas of interest. We agreed on this approach because (1) an evaluation of alternative organizational approaches can appropriately be performed by individuals with experience and close familiarity with the organizations, (2) government guidelines concerning a FFRDC's independence and objectivity are broadly stated and do not provide specific criteria with which to measure DOD's plans, and (3) the views and experiences of individuals with knowledge of FFRDCs, given the absence of specific criteria, can provide insights on the acceptability of DOD's plans.

We designed the data collection instrument based on the expert technical advice of design and methodology specialists within GAO. We also kept Committee representatives appraised of the format and substance of the instruments to be used.

A list of about 45 consultants was compiled from several sources including: consultants utilized by GAO divisions; recommendations from individuals within GAO; the National Academy of Sciences; the National Academy for Public Administration; and recommendations from the Senate Committee on Armed Services representatives. The few individuals involved with the SDI Institute proposal were excised from the list. The remaining individuals on the list of names were categorized according to their depth of experience in government, the military, industry, and education and prioritized based on the individuals' breadth of experiences across the categories. The team contacted the three or four individuals with the highest ranking in each of the experience categories. With only one or two exceptions, these individuals agreed to participate in our review. Our design and methodology specialists also indicated the appropriate number of individuals to contact in order to afford a meaningful range of responses for our review.

The backgrounds of the individuals selected, as indicated in Appendix IV of our report Strategic Defense Initiative Program: Experts' Views on DOD's Organizational Options and Plans for SDI Technical Support (GAO/NSIAD-87-43), November 19, 1986, represent a broad range of governmental, military, industry, and/or academic experience, as well as a diversity of service in current and past administrations.

STATEMENT ON STRATEGIC DEFENSE INITIATIVE INSTITUTE (SDII)
BEFORE THE STRATEGIC FORCES & NUCLEAR DETERRENCE SUBCOMMITTEE
OF THE SENATE ARMED SERVICES COMMITTEE
AND
THE OVERSIGHT OF GOVERNMENT MANAGEMENT SUBCOMMITTEE
OF THE SENATE GOVERNMENTAL AFFAIRS COMMITTEE
FOR
THE PROFESSIONAL SERVICES COUNCIL, THE BUSINESS ALLIANCE ON
GOVERNMENT COMPETITION AND THE AEROSPACE INDUSTRIES ASSOCIATION
BY
JAMES HOSTETLER
May 6, 1987

My name is Jim Hostetler and I am a partner in the Washington, D.C. office of the law firm of Kirkland and Ellis. I serve as Counsel to the Professional Services Council (PSC), and appear here today on behalf of PSC, as well as the Aerospace Industries Association (AIA), and the Business Alliance on Government Competition (BAGC), a national coalition of over 50 trade associations and organizations concerned with unfair competition from government or quasi-governmental sources. A list of BAGC members is attached.

I appreciate the opportunity to testify before these subcommittees regarding the critical issue of the desirability of establishing a new Federally Funded Research and Development Center (FFRDC) to support the Strategic Defense Initiative Organization (SDIO). PSC, AIA and BAGC are deeply concerned about the initiative to establish a Strategic Defense Initiative Institute (SDII). We believe that the establishment of a new FFRDC to provide technical support to the SDIO is unnecessary. We believe that the required technical capability can be obtained in the private sector. The proposal to establish an SDII is fundamentally anti-competitive. If this FFRDC is established, numerous private sector companies with substantial technical capability will be unable to compete to provide the types of professional support which the SDIO indicates it requires, free of any conflict of interest.

By way of background it should be noted that PSC and the U.S. Chamber of Commerce have testified on this issue as recently as April 7 of this year before the Subcommittee on Innovation, Technology, and Productivity of the Senate Committee on Small Business. That testimony included a great deal of background information on the advantages and disadvantages of FFRDCs generally, as well as deficiencies in certain laws related to FFRDCs. The information which was presented at that time is relevant to today's hearings. Accordingly, I have attached a copy of excerpts of the April 7 statement to this testimony and ask that it be made part of the record of this hearing.

In today's hearing, PSC, AIA and BAGC would like to focus directly on the issue that you now face. From our standpoint, it appears that the SDIO is seeking essentially to increase its personnel by that number of individuals who will be hired as professional staff in the SDII. It is our understanding that this number of individuals would start at 50 and may grow to be as large as 250. These individuals will presumably be available to assist general SDIO activities, just as if they were employees of the SDIO. They will, of course, not be limited by federal ceilings on compensation, nor other civil service personnel controls. The new FFRDC will be able to undertake whatever work is assigned to it without concern to the existence of comparable or superior competence elsewhere. This is true because there is an exception in the Competition in Contracting Act which permits work to be assigned to FFRDCs, like the one which the SDIO wishes to establish, without the benefit of competition. Clearly, one of the motivations of the Department for seeking establishment of an SDII must be to avoid the time, effort, and managerial demands which competing various types of projects would require. At the same time, of course, the failure to compete will inevitably result in an inability in many cases to obtain the very best technical assistance available on a given project at a particular time.

With this as background, we would like to make clear that private professional and technical services or aerospace firms in the United States have the full capability to meet all of the requirements of the SDIO. It is estimated that the private professional services firms generate over $240 billion in revenues and employ approximately 3 million people.

Let me deal with some of the specific concerns we have about the Administration's proposal. First, it should be recognized that if an SDII is established, and if history repeats itself, then DOD's stated interest in limiting the scope of the proposed institute will probably be unsuccessful. History shows that once created, FFRDCs tend to expand beyond the intent of their original mission, to perpetuate themselves, and are almost never terminated. In addition, the simplicity of asking that an FFRDC take on new work provides a compelling incentive to the sponsoring agency to expand what an FFRDC may be doing because it is expedient. This does not meet the intent of the Administration's stated policy of government reliance on the private sector for needed goods and services or the intent of Congress to increase competition in federal procurements. The historical inclination of federal agencies to utilize available FFRDCs, and to avoid the requirements of competition, was documented in the April 7 hearing before the Senate Small Business Subcommittee.

Second, the Department of Defense has stated that the establishment of an SDII is necessary so that certain functions can be performed without a conflict of interest. We believe that this argument in and of itself does not justify establishing an FFRDC. The majority of professional and technical services firms do not produce or manufacture hardware and are not affiliates of hardware-producing firms. In addition, many companies do not contract with any hardware prime contractors, and of those that do, most accept clauses that restrict contracting with hardware prime contractors on related technology. The fact is that even when there is a small possibility of an appearance of a conflict of interest, professional services firms routinely accept clauses in their contracts which exclude participation in projects that would give rise to any conflict of interest. Thus, the private sector can meet the SDIO's needs, including its concern about conflict of interest, to the same extent that a captive FFRDC would.

Third, there has been some dispute about the willingness of private sector companies to provide services comparable to those which the SDII would provide. The fact is that DOD has made no serious effort to ascertain the capabilities or willingness of the private sector to provide such services. No solicitation or request for qualification for this work has been issued. There has been no formal invitation to comment on notices published in the Federal Register indicating an intention to establish the new FFRDC and no systematic analysis of comments which were nevertheless submitted to various federal officials.

The type of work contemplated for the SDII is work routinely done by numerous qualified professional services firms. Furthermore, if the SDIO believes that no single existing private sector company presently has the precise array of skills and professional backgrounds which it seeks, professional services firms have the capability of creating an ad-hoc team with precisely the qualifications to meet SDIO requirements. The capability of private sector firms to provide the type of support now sought for the SDIO is evidenced by examples such as the Air Force's Intercontinental Ballistic Missile (ICBM) program. Although the Aerospace Corporation, which is an FFRDC, originally provided technical support to the Air Force for ICBM development, performance of the technical support function was transferred to a private sector firm several years ago. TRW has been and remains the main technical support contractor to the Air Force for ICBM development. This example provides compelling evidence that private sector firms can successfully perform the type of technical support function sought by the SDIO.

I would also like to comment briefly on two recent reports on plans to establish a new FFRDC to support SDIO. As you are aware, the General Accounting Office (GAO) has, under Congressional direction, prepared a report. If the primary analysis of the GAO report is carefully reviewed, particularly the charts that score organizational options for meeting various criteria on pages 22 and 23, then it is evident that the use of for-profit firms is in many ways as desirable as the use of FFRDCs.

Whatever the conclusions of the GAO report, however, it is clear that the methodology used by GAO in its analysis is flawed. What GAO has done is to essentially rely on responses by eleven consultants to a questionnaire. The report lacks detailed analysis and supporting arguments. Besides being too limited in scope and depth to make the subjective views of any group have much significance, the selection of these particular consultants does not reflect a sufficiently representative group to achieve balance and perspective on the policy issues raised by SDII.

Not only does an opinion poll among these eleven consultants skew results, but specific conclusions, reached with no justification, appear contrary to actual experience. A number of the conclusions appear counter-intuitive. For example, a statement in the report that "most (of the consultants) selected the for-profit firm as the highest cost option" needs explanation, since the cost-consciousness and cost control of companies engaged in competitively procured work, would support an opposite conclusion.

It will no doubt be difficult for those in Congress who must decide whether to support the creation of an SDII to draw useful summary conclusions from this GAO report. A listing of views and assertions and a questionnaire poll of eleven consultants is not the kind of substantive analysis which provides a sound basis for major policy determinations.

The Congressional Research Service of the Library of Congress (CRS) has also prepared a report, at the request of Senators Paul Simon and William Proxmire. This is a very balanced report which sets forth in clear terms many of the disadvantages of FFRDCs. These include the fact that such centers are often more costly to operate, that they tend to take on and perform inappropriate policy-making functions, that the lack of a competitive environment impairs the quality of the work that may be done by such centers, and that they often attract away some of the best scientists from in-house Federal labs. Thus, CRS clearly recognizes that the SDII option is not necessarily preferable to other approaches.

In fact, private sector firms are able and anxious to provide the service which SDIO seeks. These firms, contrary to SDIO's assertions, do possess the broad spectrum of skills which the agency requires. They can deal with issues of conflict of interest, or with any problems associated with the need for access to proprietary information. And it is certain that adequate mechanisms can be established to ensure suitable continuity in SDIO support from the private sector.

In conclusion, we would urge the Congress to make its own assessment as to whether existing alternative sources for satisfying the SDIO requirement can effectively meet special research and development needs of the agency. This is the test which Federal policy dictates, and we are confident that when that test is faithfully applied, it will show the value of relying on non-FFRDC entities to meet SDIO needs.

ATTACHMENT 1

Business Alliance
On Government Competition

1615 H Street, N.W.
Washington, D.C. 20062
202/463-5500

MEMBER ORGANIZATIONS (11/18/86):

AEROSPACE INDUSTRIES ASSOCIATION
AMERICAN ASSOCIATION OF NURSERYMEN
AMERICAN CONSULTING ENGINEERS COUNCIL
AMERICAN COUNCIL OF INDEPENDENT LABORATORIES
AMERICAN FEDERATION OF SMALL BUSINESS
AMERICAN SUBCONTRACTORS ASSOCIATION
AMERICAN TRAFFIC SERVICES ASSOCIATION
ASSOCIATED BUILDERS & CONTRACTORS
ASSOCIATED GENERAL CONTRACTORS OF AMERICA (NORTHEASTERN FLORIDA CHAPTER)
ASSOCIATED LANDSCAPE CONTRACTORS OF AMERICA
AUTOMOTIVE SERVICE INDUSTRY ASSOCIATION
BUILDING SERVICE CONTRACTORS ASSOCIATION INTERNATIONAL
CALIFORNIA ASSOCIATION OF NURSERYMEN
CALIFORNIA LATHING & PLASTERING CONTRACTORS ASSOCIATION, INC.
COMMITTEE FOR PRIVATE OFFSHORE RESCUE AND TOWING
COMMITTEE OF NATIONAL SECURITY COMPANIES
CONTRACT SERVICES ASSOCIATION OF AMERICA
ELECTRONIC INDUSTRIES ASSOCIATION
HELICOPTER ASSOCIATION INTERNATIONAL
ILLINOIS RETAIL FARM EQUIPMENT ASSOCIATION
JOINT MARITIME CONGRESS
MANUFACTURERS AGENTS' NATIONAL ASSOCIATION
MARITIME INSTITUTE FOR RESEARCH & DEVELOPMENT
NATIONAL ASSOCIATION OF ELECTRICAL DISTRIBUTORS
NATIONAL ASSOCIATION OF GOVERNMENT SERVICE CONTRACTORS
NATIONAL ASSOCIATION OF MEDICAL EQUIPMENT SUPPLIERS
NATIONAL ASSOCIATION OF PLUMBING-HEATING & COOLING CONTRACTORS
NATIONAL ASSOCIATION OF SURETY BOND PRODUCERS
NATIONAL ASSOCIATION OF WHOLESALER-DISTRIBUTORS
NATIONAL ASSOCIATION OF WOMEN BUSINESS OWNERS
NATIONAL COUNCIL OF INVESTIGATION & SECURITY SERVICES

(OVER)

NATIONAL MARINE ENGINEERS BENEFICIAL ASSOCIATION (AFL-CIO)
NATIONAL PEST CONTROL ASSOCIATION, INC.
NATIONAL RESTAURANT ASSOCIATION
NATIONAL SMALL BUSINESS ASSOCIATION
NATIONAL TIRE DEALERS & RETREADERS ASSOCIATION
NATIONAL TOOLING & MACHINING ASSOCIATION
NATIONAL UTILITY CONTRACTORS ASSOCIATION
NEW JERSEY BUSINESS & INDUSTRY ASSOCIATION
OHIO SMALL BUSINESS COUNCIL
PRIVATE SECTOR FIRE ASSOCIATION
PROFESSIONAL SERVICES COUNCIL
SHEET METAL & AIR CONDITIONING NATIONAL ASSOCIATION
SMALL BUSINESS UNITED
SMALLER BUSINESS ASSOCIATION OF NEW ENGLAND
STEEL SHIPPING CONTAINER INSTITUTE
TEXTILE RENTAL SERVICES ASSOCIATION OF AMERICA
UNITED BUS OWNERS OF AMERICA
UNITED STATES CHAMBER OF COMMERCE

ATTACHMENT 2

EXCERPT OF APRIL 7, 1987 TESTIMONY BY JACK RENNIE
ON BEHALF OF THE U.S. CHAMBER OF COMMERCE AND
THE PROFESSIONAL SERVICES COUNCIL

BACKGROUND ON FFRDCs

FFRDCs were established after World War II, when the federal government determined that its research and development needs could not effectively be met by private-sector organizational entities. The centers were created as research and development institutions exclusively or substantially financed by agencies of the government, known as sponsoring agencies. FFRDCs since have operated as private companies subject to certain congressional or sponsoring agency controls.

Most FFRDCs were established between 1942 and 1963; by 1963 the Department of Defense (DOD) had established 39 FFRDCs. Congressional pressure to reduce the number of FFRDCs, as DOD in-house capability increased, resulted in the fact that by 1976 the Pentagon supported only six centers. Today, it supports nine; three were established between 1984 and 1985 after the enactment of CICA. These new centers are the Software Engineering Institute at Carnegie Mellon University; the Logistics Management Institute in Bethesda, Maryland; and the

RAND OSD/Office of the Joint Chiefs of Staff in Santa Monica, California.

Taken together, the Departments of Defense, Energy, and Health and Human Services, the National Science Foundation and National Aeronautics and Space Administration supported 36 FFRDCs in 1985. These centers spent $5 billion in research and development funds awarded through noncompetitive funding agreements with their sponsoring agency, and they employed approximately 80,000 people during 1985.

ADVANTAGES AND DISADVANTAGES OF FFRDCs

There are, admittedly, some advantages to be derived from the establishment and operation of FFRDCs.

First, sponsoring agencies argue that because of their quasi-governmental nature, the centers are more objective and independent in the conduct of their assignments than government agencies or private-sector companies. Private-sector companies in particular are perceived by the sponsoring agency as subject to conflicts of interest. For example, it has been suggested that if a small services firm is the subsidiary of a large, hardware-producing company, its recommendations might favor the use of products produced by its parent company.

Second, because FFRDCs are not constrained by Civil Service salary and promotion regulations, they are arguably able to attract and retain high-quality staff members more easily than the federal government. This advantage addresses the difficulties faced by federal laboratories in attracting, retaining, and motivating scientists and engineers.

Third, again because of the quasi-governmental nature of FFRDCs, the centers appear to have an intimate familiarity with the sponsoring agency's activities and needs. Indeed, they perform research and development upon the direct request of the federal government and receive at least 70% of their funding from their sponsoring agency.

FFRDCs are also supposed to respond quickly to the needs of the sponsoring agency.

There are, of course, substantial disadvantages to the use of FFRDCs, most of which are also attributable to their noncompetitive, quasi-governmental nature.

First, FFRDCs are expensive to operate and have little incentive to control their costs. In fact, examination of the centers shows that they are among the highest priced of high-quality research organizations. Not only are the centers costly, but also they appear to be duplicating extensive existing capability in the private sector. Existing private-sector capabilities can be provided on a competitive basis, often at a lower overall cost to the government.

Second, FFRDCs have been criticized for having an inappropriate amount of influence over federal policy. A recent example is the DOD-proposed SDI Institute. Critics have argued that an FFRDC so tightly tied to its sponsoring agency would find it difficult to maintain its independence, and its recommendations, therefore, would be compromised. The possibility of the FFRDC making critical policy recommendations to the Pentagon, while being unduly influenced by its sponsoring agency, is obviously undesirable.

Third, another problem is the lack of accountability and of a competitive environment for the FFRDCs. In 1983, the White House Science Council's Federal Laboratory Review Panel determined lack of accountability to be one of the FFRDCs' most serious deficiences. A report by the Panel noted that "in the absence of economic and competitive forces, the Federal Laboratories must be held accountable by their agencies. Unfortunately, in most cases, the agencies' oversight means an excessive amount of reporting and paperwork, but inadequate scrutiny of the quality and relevance of the laboratories' activities."

Fourth, the exceptional nature of FFRDCs appears to have negative effects on federal in-house laboratories. The FFRDCs can pay more and, thus, hire the best talent available. Often, the centers hire scientists working for the federal laboratories. The FFRDC work often is perceived as more scientifically challenging which, in turn, has a demoralizing effect on federal laboratory personnel.

Fifth, another issue is that FFRDCs seem to have an unfair advantage in obtaining federal research and development work resulting from their long-term relationship with the sponsoring agency. Sponsoring agencies appear to be enlarging their FFRDCs' purpose, mission, and general scope of work in order to award them federal work that otherwise would have to be awarded on a competitive basis.

CICA

As you know, CICA was intended to increase competition in government contracting and to impose more stringent restrictions on the award of noncompetitive or sole-source contracts. CICA builds on the two primary procurement statutes, the Armed Services Procurement Act and the Federal Property and Administrative Services Act, to establish a uniform framework that distinguishes between competitive and noncompetitive procedures.

CICA provides several limited exemptions from requirements for competition. These include when the property or services are available from only one responsible source; when there is an unusual or compelling urgency; when necessary for industrial mobilization; when a statute authorizes or requires a procurement through an agency or specified source; when necessary to comply with international agreement or treaty terms; when in the interests of national security; and when otherwise in the public interest.

A final exemption provides that if the agency head determines that "it would be in the interest of national defense in establishing or maintaining an essential engineering, research, or development capability to be provided by an educational or other nonprofit institution or a federally funded research and development center," it may award a contract noncompetitively. Thus, FFRDCs are potentially exempt from the competitive requirements of CICA. When CICA was drafted, Congress determined that requiring FFRDCs to compete for all work might compromise the centers' ability to maintain the critical mass of researchers and experts necessary to meet the needs of a sponsoring agency.

An analysis of CICA and the accompanying conference report reveals that Congress believed that the procurement process benefits substantially from competition and that competition should be open to all capable contractors. Bill language requiring "full and open" competition ensured that access.

The exemption of FFRDCs under certain circumstances from the competitive requirements of CICA permits sponsoring agencies to avoid the effort of seeking competition. Work may be sole-sourced to FFRDCs, and often is, simply because it is easier than competition. We are aware of numerous instances in which work placed with FFRDCs was work that could have been performed by the private sector.

We recommend that CICA be amended to eliminate the special exemption from competition for FFRDCs.

DEFENSE AUTHORIZATION ACT, TITLE IX, SECTION 912

Congress included Section 912 of Title IX into the Defense Authorization Act for Fiscal Year 1987. That section limited the work placed by the Secretary of Defense with FFRDCs to work that is within the purpose, mission, and general scope of effort of the center as established in the sponsoring agreement. New FFRDCs may not be created until the head of the sponsoring agency submits to the Congress a report describing the purpose, mission and general scope of effort of the proposed center.

Section 912 also directs the General Accounting Office (GAO) to conduct a study and issue a report on the national defense role of FFRDCs. This study is to consider five points: the effectiveness of procedures ensuring that the centers are established on the basis of Office of Federal Procurement Policy (OFPP) criteria; the effectiveness of procedures ensuring that the work performed is within the appropriate purpose, mission, and general scope of effort; the growth of such centers over the past four years; the effect of exemptions from competition requirements; and the relationship of FFRDCs to their sponsors.

These requirements are a step in the right direction. With this language, Congress recognized a need to examine whether

FFRDCs unduly are enlarging their specific scope of work. I already have mentioned the Mitre example. Many FFRDCs also create subsidiaries and/or special divisions to expand the scope of work that they can perform. These divisions and subsidiaries, therefore, are unconstrained in their growth and are often in unofficial competition with the private sector. The tendency for FFRDCs to increase in size and stray from the intent of their original mission was documented recently by the White House Science Council's Federal Laboratory Review Panel in 1983. We believe that the GAO study will yield similar conclusions.

PREPARED STATEMENT OF NORMAN R. AUGUSTINE

Mr. Chairman, Subcommittee Members, I appreciate the opportunity to appear before you today. I have been asked to express my views regarding the establishment of a federally funded research and development center to provide analytical support to the Strategic Defense Initiative Organization. The subcommittees are to be complimented for seeking the wide range of opinion represented by today's list of witnesses.

At the outset, I wish to state that I serve as President and Chief Operating Officer of Martin Marietta Corporation, a firm with substantial SDI-related contracts. But I wish to speak also as one who served in government and in an advisory capacity with an FFRDC as well.

I am aware of the differences of opinion expressed on this matter to date, including the reservations expressed by you, Senator Levin, and others in Congress. Throughout the discussions on this subject, however, there appeared to me to run a common thread: The importance of an objective, competent review process to the success of SDI. On this, I believe there can be little argument.

Certainly, as we approach the crucial systems decisions and technology choices of the future, Gen. Abrahamson's challenging task will be made easier if he is afforded the benefit of expert opinion insulated from the whirlwind of controversy which seems inevitably to attend our strategic systems these days. Similarly, Congress requires assurance that the taxpayers' money is purchasing the most effective systems that industry can provide.

Perhaps the most telling circumstance to justify such an entity is the spectacle of so many eminent scientists, engineers and military experts holding completely different and, in many cases, mutually exclusive, views on the feasibility, cost and utility of a strategic defense system. Clearly, what is required is a professional process of review and synthesis, conducted by authorities in their respective fields. Most importantly, they must reassure all sides that the results have validity and integrity. Only then can sound decisions be made about the future direction of the SDI program.

Where the differences arise is, as usual, in the implementation. The General Accounting Office in its excellent report to Congress on this subject dated November, 1986, evaluated eight options: (1) establish a new FFRDC, (2) establish a new division in an existing FFRDC or national laboratory, (3) contract with an existing FFRDC or national laboratory, (4) contract with a university, (5) contract with a non-profit laboratory or corporation, (6) contract with a for-profit firm, such as an industrial firm or consortium of such firms, (7) expand the present SDIO staff, and (8) establish a new DOD field or military organization.

Speaking on my own behalf, I believe that government should do only those things which cannot or should not be done by the privat sector. This predisposition runs up against two issues in this instance: First the potential for a perceived conflict-of-interest. Much of the systems engineering and systems integration expertise in this country is resident in private industry, in many cases in firms with substantial hardware interests in SDI. Finding the right mix of talent and expertise is difficult, finding such an organization devoid of potential conflicts is more so.

The other issue is my experience in the 50's in industry and in the 70's in government dealing with anti-ballistic missile systems. First with the Nike- Zeus program and later with the Safeguard and Sentinel systems, I saw the virtues of FFRDC type analysis. Thus I read the GAO report with a fair amount of objectivity. It clearly showed that each option has its advantages and drawbacks, but again a common thread emerges. With the exception of comparative cost, in which there was no clear advantage, the establishment of a new FFRDC was deemed the preferred option.

I believe that I would concur with this assessment. If I were Gen. Abrahamson, indeed, if I were a Senator having to make important funding decisions, I would want SDIO to have a dedicated, full-time resource, one with the independence and expertise necessary to point out pitfalls and identify potential breakthroughs.

The other options fail the test of either objectivity or effectiveness or both. With respect to an existing FFRDC or national laboratory, I fear that SDIO might find itself contending with a preoccupied partner or, equally bad, the "department store" syndrome, in which depth is sacrificed in favor of breadth. Other for-profit and non-profit institutions, including universities, tend to have, in the main, a focus or specialty which could color their analysis. In the ecumenical research program that is SDI, such biases could be especially harmful. And given the temper of the times, an expansion of SDIO or DOD staff would no doubt meet with a jaundiced eye here on Capitol Hill.

Thus, to meet our agreed requirements of objectivity and competence, a new FFRDC would seem to be the wisest choice. Speaking from an industry point of view, I would welcome the establishment of such an entity. It would serve to insulate SDI from much of the political pressure to which it has been subjected. As SDI funnels down to identifiable technology and systems vectors, the new FFRDC could help insure against the wrong choices being made. Believe me, American and allied industry have produced a breathtaking array of technologies and system designs from which Gen. Abrahamson must choose in validating the strategic defense concept. The review and analysis function will make or break the value of these efforts to our national security.

Beyond the issue of what we should establish, there remain a number of thorny problems such as personnel selection, oversight, etc. Certainly a fair and manageable arrangement is achievable. In the choice of the FFRDC Director, I do not see how Gen. Abrahamson can or should be excluded from such a decision. In his role as manager, Gen. Abrahamson will need a responsive asset to help him deal with the welter of activities and conflicts inherent in such an enterprise. In his role as executive, however, he will need an independent, sometimes even adversarial voice to test the thrust of his program.

This seeming paradox between responsiveness and independence can be resolved, I believe, by the establishment of a strong Board of Directors, composed of respected individuals whose integrity is proven. In this way, Gen. Abrahamson can have a director compatible with the imperatives of such a specialized research program, and the public can be assured of a board sensitive to the imperatives of objectivity.

In conclusion, I wish to point out that some of our most outstanding engineering achievements have been midwifed, if you will, by organizations such as the one being proposed. Rand, IDA, CNA, Aerospace Corporation and others have helped fashion the defense systems on which this nation has depended for many years. At least as important as those systems fielded have been those weeded out, the "turkeys" that never saw the light of day. It is here that an FFRDC truly earns its keep by preventing flawed technology and ineffective systems from draining our resources and diverting the talent of many fine engineers. The nation has invested significantly in the program which seeks to free us from the threat of nuclear attack. We have our superb technology base and our finest engineering talent at work on this task. Given a sound and objective review, SDI is sure to produce developments of lasting value to the Free World.

United States Senate
WASHINGTON, D.C. 20510

May 15, 1987

Mr. Norman R. Augustine, President
Martin Marietta Corp.
6801 Rockledge Drive
Bethesda, Maryland 20817

Dear Mr. Augustine:

Thank you for your testimony on May 6, 1987, at the joint hearing concerning the need for and operation of the proposed Strategic Defense Initiative Institute (SDII). We appreciate your being able to participate on such short notice.

Senator Thurmond would like your response to two additional questions for inclusion in the hearing record:

1. As an expert on the weapons' acquisition process, in your judgment, would the technical and analytical support provided by an SDII enhance the prospects for proper consideration of technology, hardware and system issues pertinent to full scale development and deployment decisions?

2. As a representative of the private sector, what reservations do you have about establishing a new Federally-Funded Research and Development Center (FFRDC) to provide technical support to the SDIO? What advantages do you see in this approach, which is recommended by DOD?

Mr. Norman R. Augustine
May 15, 1987
Page Two

If possible, we would appreciate your response to these questions by May 22, 1987. If you need additional information, please contact Elise J. Bean at 224-3682 or Robert Bott at 224-9349. Thank you again for your assistance in this important matter.

Sincerely,

Carl Levin

Carl Levin
Chairman
Subcommittee on Oversight
of Government Management

James Exon
Chairman
Subcommittee on Strategic
Forces and Nuclear Deterrence

CL/JE:ejb

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6801 ROCKLEDGE DRIVE
BETHESDA, MARYLAND 20817
TELEPHONE (301) 897-6185

NORMAN R. AUGUSTINE
PRESIDENT AND CHIEF OPERATING OFFICER

22 May 1987

Sen. Carl Levin
Chairman, Subcommittee
On Oversight of Government
Management
United States Senate
Washington, D.C. 20510

Dear Senator Levin:

In response to your letter of 15 May 1987, I submit the following answers to Senator Thurmond's questions:

1. As SDI research proceeds, there will inevitably be important decision points regarding the technical maturity and military utility of the resulting hardware and systems candidates. In my experience, even the most honorable men and women find it difficult to objectively evaluate a program to which they have dedicated a great deal of time and effort. Surely the availability of a competent, independent review process is desirable in such a case.

   In addition to the therapeutic influence an SDII can exert on the progress of SDI research, it can also serve as a public agent, certifying the results of this research and consolidating the gains which are made.

   Certainly, before we tackle the difficult and politically sensitive question of SDI deployment, we must have a clear sense of system and component capabilities against a realistic threat. Both the threat postulation and system performance evaluation must be the product of expert and objective review. The establishment of an SDII would be a major step in ensuring this review.

2. My only reservation regarding the establishment of an FFRDC to support SDIO is an instinctive one. I am generally averse to the federal government competing with private enterprise when both are capable of carrying out the required task. In this case, however, the special requirements for total objectivity, responsiveness and specialization really point to the need for an FFRDC-type of institution.

The advantages lie in the ability to attract (and compensate) absolutely first-class talent, to focus exclusively on SDI issues, and to be relatively free of commercial influence. These are compelling advantages for this particular instance.

I would emphasize that the views expressed in this letter as well as in my testimony are purely my personal opinions and do not necessarily reflect those of others in the industry or among my other associations. Please contact me if I may be of further assistance to you, Senator Thurmond or the other members of the subcommittee in your deliberations.

Sincerely,

Norman R. Augustine
President

mem

TESTIMONY OF ROBERT L. PARK
DIRECTOR OF THE OFFICE OF PUBLIC AFFAIRS OF THE AMERICAN PHYSICAL SOCIETY

BEFORE THE COMMITTEE ON GOVERNMENTAL AFFAIRS
SUBCOMMITTEE ON OVERSIGHT OF GOVERNMENT MANAGEMENT

ON THE NEED FOR AND OPERATION OF A STRATEGIC DEFENSE INITIATIVE INSTITUTE

MAY 6, 1987

Mr. Chairman and Members of the Committee:

The American Physical Society recently released a report of a major study, the Science and Technology of Directed Energy Weapons. I believe that report may be instructive in discussing the need for independent technical advice on the Strategic Defense Initiative.

The American Physical Society is the scientific and educational organization in the U.S. representing all fields of physics. Its more than 38,000 members are drawn from industry, academia and government and include some 3,000 foreign members. The Society seeks to advance the knowledge of physics by organizing conferences and publishing journals to disseminate new scientific results. Since the founding of the Society in 1899, these activities have played an essential role in the rise of American physics to its present position of leadership in the world.

Recognizing the profound changes in the relationship between science and society that have occurred in this century, the Society has been active in recent years in informing the public on physics-related issues. These studies have earned a reputation for clarity and objectivity.

In his speech to the American people on March 23, 1983, President Reagan called upon "the scientific community, those who gave us nuclear weapons, to turn their great talents now to the cause of mankind and world peace, to give us the means of rendering these nuclear weapons impotent and obsolete." The American Physical Society responded to the President's challenge by convening a panel of experts in directed energy technologies to undertake an impartial evaluation of the physical basis and the technological feasibility of directed energy weapons. Directed energy weapons, including lasers and particle beams have been considered a key element of a strategic defense because of their potential to attack enemy missiles over great distances at or near the speed of light.

Several steps were taken to ensure the independence of the Study Group:

- Funding for the Study was not sought from the Department of Defense. It was provided privately by the APS with the generous assistance of the Carnegie Corporation and the MacArthur Foundation.
- Assurances of cooperation were received in advance from the Science Advisor to the President, the Under Secretary of Defense for Research and Engineering and the Director of

SDIO. That cooperation, in the form of classified briefings, was generously and professionally provided by SDIO.

- The APS Study Group was a broadly constituted panel whose distinguished members were drawn from major universities, industrial and national laboratories. Many have extensive knowledge of weapons technologies.
- A review committee of very senior physicists, with many years experience in providing the government with technical advice, was named to advise the panel on the final report.

The co-chairmen of the study group, Nicolaas Bloembergen, Nobel Laureate, Harvard University, and Kumar Patel, an Executive Director in the research organization at ATT Bell Laboratories, are renowned for their pioneering research on lasers. Members of the Study Group included the Director of MIT Lincoln Laboratory, a Technical Director of the Air Force Weapons Laboratory, the former Director of the Lawrence Berkeley National Laboratory, an associate of the Arms Control Center at Stanford University, a member of JASON, plus several members of the National Academies of Science and Engineering. They represent a wide range of talents and backgrounds in nuclear physics, solid state physics, lasers and particle beams, electronics, optical and microwave technologies, and have extensive experience in technology evaluation and systems analysis. In spite of the diversity of the panel their report was unanimous.

The review committee, headed by Dr. George Pake of the Xerox Corporation, included two scientists Arthur L. Schawlow, of Stanford, and Charles H. Townes, of the University of California, Berkeley, who earned Nobel Prizes for their work in lasers.

Among the findings of the study:

- The development of an effective ballistic missile defense utilizing directed energy weapons would require performance levels that vastly exceed current capabilities.
- There is insufficient information to decide whether the required performance levels can ever be achieved.
- A decade or more of intensive research would be required to provide the technical knowledge needed for an informed decision about the potential effectiveness and survivability of directed energy weapon systems.
- The important issues of system integration and effectiveness depend critically on information that does not now exist.

In commenting on the APS study, SDIO acknowledges that the panel "astutely applied physical principles in their analysis," but finds the conclusions to be "subjective and unduly pessimistic."

Certainly the Department of Defense could not be charged with "undue pessimism" in its assessment of the feasibility of SDI. The Secretary of Defense, in a speech last week to the Commonwealth Club of California, declared that "The question for the United States today is not, can we build an effective strategic defense? I am confident we can." It is a confidence that is not shared by the APS panel of scientific experts.

Perhaps a little less optimism would not be inappropriate. The American people are being asked to risk enormous waste of financial and human resources on deployment of SDI components in a state of technological uncertainty, a deployment that may make us less, rather than more, secure. I do not believe the decision to press for early deployment is motivated by independent scientific advice.

This then is the problem. The sort of unsolicited scientific evaluation provided by the APS study of directed energy weapons fills an important need in our open system of government and should be heeded. It represents the most independent assessment available. It does not, however, satisfy the need of SDIO for timely and cost effective responses to the wide range of technical questions that will arise in efforts to integrate so complex a system.

Two questions should be addressed:

1) Is the creation of an SDI Institute premature? FFRDC's are normally associated with the implementation of programs involving mature technologies and perhaps are not appropriate to a research program. It is the judgement of the APS Council that there should be no early commitment to the deployment of SDI components.

2) Would the SDI Institute that is proposed be sufficiently independent? The Institute should feel no pressure to trim technical judgements to conform to political priorities.

Organizationally, the Institute should have as few links to SDIO as possible. The requirement that the senior staff of the Institute all be committed to the goals of the program, for example, seems unwise.

SDI has plenty of cheerleaders; a few skeptics might be helpful. Objectivity is hard to find in the absence of independence.

UNION OF
CONCERNED
SCIENTISTS 1616 P Street, NW S.310 · Washington, DC 20036 · (202) 332-0900

STATEMENT OF THE UNION OF CONCERNED SCIENTISTS ON THE STRATEGIC DEFENSE INITIATIVE INSTITUTE BEFORE THE GOVERNMENTAL AFFAIRS COMMITTEE, OVERSIGHT OF GOVERNMENT MANAGEMENT SUBCOMMITTEE AND THE ARMED SERVICES COMMITTEE, STRATEGIC FORCES AND NUCLEAR DETERRENCE SUBCOMMITTEE OF THE UNITED STATES SENATE

MAY 6, 1987

The Union of Concerned Scientists strongly opposes the Defense Department's plan to establish a think tank specifically to provide technical support to the Strategic Defense Initiative (SDI) Organization. The proposed Star Wars institute is a thinly-veiled attempt to confer scientific legitimacy on a controversial program that has proved incapable of securing it on its own.

The Pentagon envisions playing an extensive role in the formation of the institute. This raises serious concerns about the proposed center's mission, staffing procedures and independence. It is difficult to avoid the conclusion that rather than seek objective technical evaluation, SDIO is looking for a visible seal of approval for the Star Wars undertaking.

It is no secret that the SDI has been harshly criticized by a vast majority of this country's leading physicists and has encountered tremendous skepticism in the Congress. As summarized on the attached sheet, opposition to SDI within the scientific community is deep and widespread.

SDIO together with its legislative allies covet the technical and hence political sanction for Star Wars they believe a think tank would promote. The renewed push for the SDI Institute (SDII) is part of the Administration's announced intention to lock Star Wars in place, to make it irreversible regardless of its feasibility or wisdom.

If in fact SDIO does require additional technical support, it has failed to demonstrate that one or more of the existing federally funded research and development centers (FFRDC) could not meet the need. Military and civilian agencies currently support 36 FFRDCs and at least 13 of these have been engaged in SDI-related research involving contracts totaling well over $1 billion since the program's inception.

Among other alternatives for the requisite technical assistance are government organizations like the Office of Technology Assessment, private for-profit firms, and non-profit firms including universities and laboratories. Although an SDIO study reached the self-serving conclusion that only a new FFRDC dedicated exclusively to SDI was appropriate, the SDIO has declined to make public this internal working document.

Judging from the details of the Defense Department's plan to establish the SDII, there is sufficient grounds for questioning whether the sponsoring agency is interested in objective, independent evaluation. What is clear is that if SDIO were to have its way, the integrity of the institute would be compromised.

Peer review is generally considered essential to unbiased scientific inquiry. Yet the Pentagon would not require outside experts to evaluate proposals submitted to SDIO to organize the center. As for staffing, SDI program chief General James Abrahamson has acknowledged that he intends to have final veto over the selection of the institute's director and wide discretion with regard to senior level staff. This would represent an unprecedented degree of involvement by a sponsoring agency in hiring decisions for an FFRDC.

Congress wisely exercised its oversight responsibility last year when it enacted legislation requiring the Defense Department to secure the approval of Armed Services and Appropriations Committees before an SDII could be established. SDIO has failed to convince Congress as to the wisdom of setting up a Star Wars think tank. The Union of Concerned Scientists strongly concurs in that finding.

The Pentagon's blueprint for creating and operating the SDII mocks the idea that it is seriously committed to securing objective technical advice. At the very least, SDIO's plan would lend credence to the perception of impropriety. A more troubling concern is that the proposed institute would become a propaganda mill designed to bolster the flagging credibility of the Star Wars program and give it a veneer of technical legitimacy which in the judgment of the scientific community, it has been unable to achieve.

Howard Ris
Executive Director,
Union of Concerned Scientists

**UNION OF
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SCIENTISTS' VIEWS OF STAR WARS:
Greater Scrutiny Leads to Stronger Opposition

As research into the feasibility of space-based defense against nuclear missiles under the Strategic Defense Initiative (SDI) has increased, scientific skepticism of the proposal, known as the Star Wars program. These are some landmarks in the growth of scientific opposition to Star Wars:

May 1985 - More than half of the members of the National Academy of Sciences and 57 American Nobel laureates sign a petition circulated by UCS urging the United States and the Soviet Union to ban testing and deployment of weapons in space.

March 1986 - A Senate report based on interviews with scientists conducting key SDI research at government labs disputes Administration claims that SDI is "technically feasible." The lab scientists say that difficulties in the SDI concept are far more severe than first anticipated, and that SDIO's demonstration projects undermine their credibility as scientists.

March 1986 - A nationwide poll indicates American physicists oppose SDI by a 2:1 margin; more than 80% believe that any SDI program could be defeated by Soviet countermeasures.

May 1986 - Close to 7,000 scientists in the academic areas most critical to SDI pledge not to accept SDI research funds. The scientists include 15 Nobel laureates and a majority of the professors at the nations's top 20 physics departments.

June 1986 - Some 1,700 scientists and engineers at government and private research laboratories call on Congress to reduce SDI funding to a program of exploratory research, claiming that a Star Wars "shield" is not feasible in the foreseeable future.

October 1986 - A survey by the Cornell Institute for Social and Economic Research shows 98% of the National Academy of Sciences in disciplines most relevant to SDI research (the mathematical, physical, and engineering sciences) think SDI could not provide an "effective defense of the US civilian population" if the Soviets employ countermeasures. Seventy-eight percent think SDI could not be made survivable or cost-effective in the 25 years; only 4% think the chances of doing so are better than even.

o January 1987

Cambridge Office: 26 Church Street · Cambridge, Massachusetts 02238 · (617) 547-5552

STATEMENT OF
COMMON CAUSE

on the
STRATEGIC DEFENSE INITIATIVE INSTITUTE

submitted to the
ARMED SERVICES COMMITTEE
STRATEGIC FORCES AND NUCLEAR DETERRENCE SUBCOMMITTEE

and the

GOVERNMENTAL AFFAIRS COMMITTEE
OVERSIGHT OF GOVERNMENT MANAGEMENT SUBCOMMITTEE

of the
UNITED STATES SENATE
May 12, 1987

We are pleased to have the opportunity to submit testimony on the question of whether Congress should fund the Pentagon's proposed Strategic Defense Initiative Institute (SDII). The Strategic Defense Initiative has been an issue of major concern to Common Cause since early 1984 and we appreciate the opportunity to present the Committee with our views.

Common Cause strongly urges Congress not to authorize or appropriate any funds to establish a Strategic Defense Initiative Institute. In addition, we urge Congress to retain the process it established in 1986 that requires authorization and appropriation votes prior to the expenditure of any funds for an SDII.

We believe that the Pentagon has failed during the past two years to convincingly demonstrate why an SDII, which would operate as a federally funded research and development center (FFRDC), is needed to provide advice about the SDI program. The Pentagon's rationale for SDII further is based on far-reaching policy projections for the SDI program that presently have little basis in political or technical reality. Indeed, a number of military analysts have questioned why existing resources are not adequate to fulfill the Pentagon's needs.

The impetus behind the SDI Organization's (SDIO) 1986 proposal for an Institute appears to stem from growing political pressure to entrench the SDI program rather than any driving need for technical advice of the nature that would call for creating an entire new entity. The original plan would have created an organization likely to serve as a captive advocate for SDI, rather than as an objective, outside observer. While the Pentagon has backed away from some of its more extreme proposals, many fundamental questions remain about the credibility of its plans to establish an "independent" SDI Institute.

We believe that the SDII proposal warrants particular Congressional concern because of its links to the controversial SDI program. The size and growth of the SDI research budget to date have been unprecedented and have occurred despite the fundamental concerns that many military, scientific, and arms control experts have raised regarding the value and effectiveness of this program. In fact, the Reagan Administration's $5.9 billion request for the SDI program in FY 1988, if granted, would make SDI the single largest weapons program in the Pentagon budget. With the national security stakes in SDI so high, Congress has a particularly critical oversight role to exercise in this arena -- and this includes whether the Pentagon should establish an SDII.

Our testimony examines the validity of the Pentagon's stated need to create an SDII. It also explores faults with the Pentagon's original 1986 proposal for an SDII and lingering concerns about current plans to establish an SDII.

The need for an SDII has not been established

Common Cause believes that research into ballistic missile defense with the basic goal of strengthening U.S. national security does not require a new SDI Institute.

Secretary of Defense Caspar Weinberger wrote the Senate Armed Services Committee in August 1986 that an SDI Institute is needed to provide "immediate" technical support for the program because of "the accelerating rate of research and the evolution of the program."

Yet Congress increasingly has been reluctant to provide the enormous increases in SDI funding requested by the Administration. For example, both the House of Representatives and the Senate Armed Services Committee have voted to mandate that the administration abide by the traditional interpretation of the ABM Treaty, which declares that neither the Soviet Union nor the U.S. shall develop, test or deploy space-based, air-based, sea-based or mobile land-based missile defense components.

And SDI funding can no longer be termed "accelerating." Last year, Congress slashed nearly $2 billion from the Reagan Administration's $5.4 billion budget request for SDI. This year, the question is not whether the Administration's FY 1988 SDI budget request of $5.9 billion will be cut, but by how much.

The liklihood of Congress imposing new policy and spending restrictions raises two basic questions about an SDII that the Pentagon has not answered adequately:

- Why does the Pentagon immediately need a new FFRDC to conduct SDI research when it has been able to conduct a prudent research program in the past without a separate Institute?

- Why are existing military research facilities unable to provide the needed technology program review and oversight?

The government rules used to determine whether new FFRDC's should be created directly address these questions. Office of Management and Budget (OMB) guidelines state that federal agencies should only establish an FFRDC in order "to meet some special research or development need which at the time, cannot be met effectively by existing in-house or contractor resources."

A November 1986 survey of defense consultants by the General Accounting Office (GAO) explored a number of options the Pentagon could pursue. The GAO survey found that the creation of a new division within an existing FFRDC would be just as effective -- and possibly less costly -- in handling SDIO's needs as would be creating a brand new FFRDC. The consultants expressed concerns about a new FFRDC's ability to attract top quality people and to be established quickly and at relatively less cost than other options.

Retired Air Force General Glenn Kent, now an analyst with the Rand Corporation, testified before the House Armed Services committee in March 1987 that "Existing FFRDCs would be delighted to assist SDI." He added that, "the need for scientific and technical advice does not relate to a necessity to set up a separate [SDI] Institute."

SDIO currently has hundreds of millions of dollars worth of contracts with think tanks similar to an SDII. SDI contract data reveals that five Pentagon-sponsored FFRDCs and eight other FFRDCs run by the Department of Energy already have SDI contracts. (See Appendix A.) Further, dozens of in-house government laboratories, universities and other non-profit organizations currently are involved in SDI research.

Congress blocks the Pentagon's original plans for an SDII

In March 1986, the Pentagon publicly announced plans to create the SDII, as a new FFRDC. Subsequently, SDIO estimated that an SDII could employ up to 300 professionals and cost about

$35 million per year. During the past year, General James Abrahamson, director of SDIO, has repeatedly said that an SDII would offer "objective, conflict-free advice" in a way that private industry could not.

But the initial proposal for an SDII put forward by the Pentagon in 1986 would not have been a particularly fair and impartial judge. For example, unlike existing FFRDCs, General Abrahamson had planned to name the top officials of the Institute. Moreover, while existing FFRDC's have some leeway to determine their own studies, the proposed Institute would have been unable to perform any work in SDI areas not specifically requested by SDIO. In contrast, the Center for Naval Analysis, an FFRDC sponsored by the Navy, has about 15 percent of its budget devoted to independently initiated studies.

These and other nagging problems generated considerable concern about the underlying aims of the proposal on Capitol Hill during 1986. "Right now this looks more like a rubber stamp tank than a think tank," Senator William Proxmire (D-WI) concluded at the time the Pentagon's proposal was announced. As a result of a series of questions raised about the independence of and need for the proposed SDII, Congress blocked its establishment by the Executive Branch in 1986, requiring instead that any such institute go through the normal channels of Congressional authorization and funding.

Many unanswered questions remain about an SDII

The Pentagon's revised proposal for creating an SDII still is rife with procedural problems that raise fundamental conflict of interest concerns. OMB rules require FFRDCs "to operate in the public interest free from organizational conflict of interest" and to maintain their "objectivity and independence" from the sponsoring agency. But current Pentagon plans still raise a number of serious concerns. For example:

- Peer Review. SDIO did not solicit competing proposals for an SDII and plans to be the sole body to review proposals to operate an SDII. But the 1986 GAO study found "that some type of peer review of the proposal(s) is necessary to best guarantee independence and objectivity."

- Independent research. The Pentagon says it will allow such research, but it has not specified how much or what kind. It could award a small sum of money for independent research, but not enough to support a credible program. In short, an SDII could be a think tank without the room to fully explore the host of critical questions that remain unanswered about the costly weapons systems and other technologies that eventually may comprise SDI. Robert S. Cooper, the former Director of the Pentagon's Defense Advanced Research Projects Agency (DARPA) and currently President of Atlantic Aerospace Electronics Corp. has proposed that 50 percent of the SDI Institute's funding be independent from the sponsoring organization.

- Staff selection. Originally, SDIO wanted to help select the leading management personnel for an SDII. Now, it wants veto power over the President and "review and comment authority for other organization officers and senior technical directors" on the staff, according to SDIO's 1987 report to Congress. Power over staff selection could well compromise SDII's independence and objectivity. At eight of the nine FFRDC's currently sponsored by Pentagon agencies, the Department of Defense cannot interfere with hiring the executive officer.

- Subcontracting. If an SDII was formed, it is doubtful the think tank could do everything the Pentagon says it could. For example, according to SDIO's 1987 report to Congress, "It is possible that the SDII may subcontract in appropriate circumstances." But a May 1986 Congressional Research Service report questioned that approach: If subcontracts are let, "then what is really to be gained by setting up an organization once removed from SDIO in the first place? And, how then will SDII studies be sheltered from interest conflict and bias?"

- Conflict of interest restrictions. The Pentagon's plans for conflict of interest rules are hazy, at best. For example, SDIO still plans to allow its staff members to work at an SDII "in isolated instances and as a temporary measure to fill an immediate need." And apparently the non-governmental advisors to SDIO who urged that an SDII be established could seek high-paying jobs with the new think tank.

In sum, the Pentagon is on very weak grounds arguing that existing FFRDCs have vested interests -- and thus should not be relied upon by SDIO for research -- while its own SDII would not. The proposed SDII will have an advocacy agenda to fulfill, namely helping to promote the SDI program. In fact, the key to the success of the proposed SDII, according to a March 1986 SDIO study, "must be total and exclusive dedication to the SDI program." An FFRDC tied closely to SDIO and its program goals would lack the appearance and reality of independence and objectivity.

Conclusion

Why is SDIO so urgently pursuing this new think tank? One prominent reason that has been offered by SDIO officials is that an FFRDC, such as an SDII, would be able to attract top-flight scientists and engineers by offering prospective employees lucrative salaries. Indeed, one proposal currently being explored would pay an SDII president $225,000 -- more than any other FFRDC president currently makes -- and the senior staff $110,000.

Another likely reason is that in the minds of SDI supporters a pro-SDI think tank could improve the scientific and technical credibility of the SDI program, which has been the subject of scathing attacks by a number of America's most respected scientists and engineers.

In addition, the formation of a pro-SDI think tank with hundreds of staff could add another layer to the infrastructure currently growing in government and in the private sector determined to try to gather the momentum needed to lock the next president into carrying SDI forward. FFRDC's "seldom die and fade away," says former DARPA director Cooper. They "will last virtually forever." In fact, one of the Pentagon's first proposed moves would be to guarantee funding for the new research institute for five years -- that means a projected $200 million outlay.

When considered on its merits, the Pentagon's proposal to create a new SDI Institute raises a number of serious concerns about the need for the Institute, its ultimate independence from SDIO and its objectivity. Moreover, SDIO apparently could fulfill the needs for scientific and technical advice it has identified by using existing resources. The Pentagon's proposal is too binding, too costly and premature for such a controversial research program that is still in its infancy. We therefore urge you to reject the proposed creation of an SDII.

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Appendix A

Federally Funded Research and Development Centers with SDI contracts 1983-1987

(Source: Federation of American Scientists)

FFRDC	Total Value of Contracts
DOE Lawrence Livermore National Lab	$552 million
DOE Los Alamos National Lab	458 million
DOE Sandia National Lab	217 million
DOE Argonne Lab	35 million
DOE Hanford National Lab	27 million
DOE Brookhaven National Lab	17 million
DOE Oak Ridge National Lab	5 million
DOE Lawrence Berkeley National Lab	4.8 million
DOD MIT	$350 million[1]
DOD Institute for Defense Analysis	6.5 million
DOD MITRE Corp.	2.4 million
DOD RAND	1.1 million
DOD Aerospace Corporation	$80,000

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[1] Most of the MIT total is accounted for by work conducted at the MIT Lincoln Laboratory.

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THE STRATEGIC DEFENSE INITIATIVE INSTITUTE: AN ASSESSMENT OF DOD's CURRENT PROPOSAL

Prepared at the request of the

Honorable Paul Simon and Honorable William Proxmire

by

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May 30, 1986

THE STRATEGIC DEFENSE INITIATIVE INSTITUTE: AN ASSESSMENT OF DOD's CURRENT PROPOSAL

INTRODUCTION

The Department of Defense (DOD) recently declared its intention to establish a Federally Funded Research and Development Center (FFRDC) to be devoted solely to the support of the Strategic Defense Initiative Organization (SDIO). The new center is to be designated the Strategic Defense Initiative Institute (SDII). This report compiles the currently available information on the purpose and nature of the SDII, and the process for establishing it. The report examines the advantages and disadvantages to the Federal Government of using FFRDCs, and addresses some of the pros and cons of the SDII proposal.

THE STRATEGIC DEFENSE INITIATIVE INSTITUTE

The DOD disseminated their first formal public notice of intent to establish the SDII in The Federal Register on March 18, 1986.[1] According to the notice, the primary purpose of the new FFRDC will be to perform a technology evaluation and integration role in support of the SDIO. In other words, SDII will evaluate SDI-sponsored research and technology development efforts of other organizations including contractors, national laboratories, university groups, and the armed services. And, SDII will be responsible for integrating concepts and technologies into alternative macro-level system architectures.[2] Results of such work, including the tradeoffs associated with each technology or option, will be presented to SDIO where all decisions regarding the future course of the SDI R&D program will be made. Additional SDII functions as described in The Federal Register notice include, but are not limited to: performing test and evaluation planning, integrating offense/defense scenarios and analyses into useful conclusions; framing issues for decision by the SDIO, and developing and maintaining a data base on active SDI projects and capabilities, continually analyzing same for overlap, duplication, and opportunities for coordination.

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[1] Federal Register, v. 51, no. 52. Mar. 18, 1986. p. 9243-9244. Federal procurement policy dictates that at least three notices of intent must be placed over a 90-day period in both The Federal Register and the Commerce Business Daily indicating the scope and nature of the effort to be performed.

After conducting an internal evaluation, DOD concluded that the proposed new FFRDC will be able to provide these services to SDIO in a manner that is more timely, cost effective, and productive than currently possible. A DOD spokesman reports that their goal is an organization free from actual, potential, or apparent individual or organizational conflicts of interest and from program bias.[3] To meet these requirements, the SDII is to be dedicated exclusively to serving the SDIO in the capacities outlined above.

DOD plans to exercise its sole source contracting authority to form the SDII. Secretary of Defense Caspar Weinberger has asked a prominent group of scientists with SDI experience to submit a proposal to DOD for review and probable acceptance.[4] Any other proposals submitted for this purpose will be reviewed by DOD, but probably not chosen. All reviews will be conducted by a technical evaluation team led by Lt. General Malcolm O'Neill, Deputy Director for Programs and Systems at SDIO. There are no plans for supplementary peer review from either inside or outside DOD. Submission of a proposal is expected sometime in June of this year. Soon thereafter, DOD plans to issue a five year renewable contract. DOD would like the SDII to begin operating by the end of FY86.[5]

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[2] For more information on SDI system architectures see, CRS Report No. 86-8 SPR, The Strategic Defense Initiative: Program Description and Major Issues by Cosmo DiMaggio, Arthur F. Manfredi, Jr., and Steven A. Hildreth. Jan. 7, 1986.

[3] Personal conversation with Mr. Richard Sybert, Special Assistant to the Secretary of Defense, Apr. 15, 1986.

Assuming that the requested proposal meets SDIO's needs, the current plan is for the proposal's signatories to become the interim board responsible for crafting the organization's charter and selecting its president. Formation of a permanent board is expected to occur shortly thereafter. The permanent board will probably appoint the remaining upper level management down to the research director level. SDIO would like to be involved in the final selection of these personnel. Additionally, SDIO would like to influence the hiring of all other technical personnel by determining the expertise required for all technical positions throughout the organization. However, these roles are subject to final SDII contract provisions.[6]

The ultimate size of the SDII is unofficially estimated to be between 100-200 people. Likewise, funding levels have been unofficially estimated at $20-30 million per year. DOD is uncertain at this point where this money will come from. However, DOD has indicated that, for at least its first year of operation, avenues for reprogramming DOD/SDI funds will be explored that do not require congressional approval.[7]

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[4] The identities of these scientists have not been made public by DOD.

[5] Personal conversation with Richard Sybert on Apr. 15, 1986.

[6] Ibid.

DOD is requiring that the SDII be located in the Washington, D.C. metropolitan area. Aside from some computer capability, it will not have its own research facilities. Instead, SDIO intends for SDII to have access to research results from all others working on SDI, including the forthcoming government-owned, contractor-operated National Test Bed.[8] SDIO also wants SDII to have input into test bed requirements and test formulation.

BACKGROUND ON FFRDCs

Historical Overview

Federally Funded Research and Development Centers (FFRDCs) (also referred to as Federal Contract Research Centers or FCRCs) are research and development (R&D) institutions which exclusively or substantially are financed by an agency of the Federal Government. FFRDCs are a special classification of Federal laboratories that are not subject to Civil Service regulations. They operate as private corporations, although they are subject to certain personnel and budgetary controls imposed by Congress and/or their sponsoring agency. The Department of Defense has established FFRDCs to augment certain in-house R&D capabilities. According to the Office of Federal Procurement Policy, Federal agencies should only establish an FFRDC in order "to meet some special research or development need which at the time, cannot be met effectively by existing in-house or contractor resources."[9]

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[7] Personal conversation with Richard Sybert on Apr. 15, 1986.

[8] The National Test Bed will be a geographically distributed network of facilities used for simulation of battle management and C^3 concepts, and for evaluation of system architectures and their component technologies. Its focal point will be a National Test Facility whose operator and location are yet to be determined.

Most DOD FFRDCs were established between 1942 and 1963 when, for various reasons (e.g., lower pay than in the private sector and slow hiring procedures), the Pentagon was not able to attract the scientific and technological talent necessary to meet their broad research needs. Further, DOD realized that most of the technical talent was located in "hardware" companies that had a strong vested interest in the support of certain Pentagon research and development. Consequently, rather than contracting with these companies, DOD developed FFRDCs to provide it with objective science and technology advice on solutions to problems which had been experienced by the Federal Government during World War II.

Between 1942 and 1963, DOD established 39 FFRDCs. This rapid growth of independent research organizations began to raise serious concerns in Congress. Critics in Congress and elsewhere felt that the Pentagon was placing too much of its sensitive research and policy related work with these independent external groups. Further, most of the FFRDCs were originally established to conduct R&D in areas in which the Government did not yet have expertise. As DOD in-house capabilities expanded, Congress expected the number of FFRDCs to decrease, something that was not happening. However, as a result of continuing congressional pressure, DOD announced in 1964 that it would reduce their number of FFRDCs from 39 to 21. The Pentagon contended that many of the centers had completed their original mission and were no longer capable of responding to DOD's changing needs.[10] Reductions continued in the following years and by 1976, the Pentagon had reduced the number of FFRDCs it supported to six.

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[9] Office of Federal Procurement Policy, OFPP Policy Letter 84-1. Federally Funded Research and Development Centers. Apr. 4, 1984. Executive Office of the President, Office of Management and Budget, Washington, D.C.

Current Characteristics of FFRDCs

In order to establish an FFRDC, an agency must follow the guidelines developed by the Office of Federal Procurement Policy (OFPP), within the Office of Management and Budget.[11] According to the National Science Foundation, once the agency implements the OFPP guidelines, the new FFRDC should possess the following characteristics:

1. Its primary activities include one or more of the following: basic research, applied research, development, or management of research and development;
2. It is a separate operational unit within the parent organization or is organized as a separately incorporated organization;
3. It performs actual research and development or R&D management either upon direct request of the Federal Government or under a broad charter from the Federal Government, but in either case under the direct monitorship of the Federal Government;
4. It receives its major financial support (70 percent or more) from the Federal Government, usually from one agency [within DOD a particular branch of the service, e.g., Navy, Air Force, or Office of the Secretary of Defense (OSD) is responsible for monitoring and evaluating individual FFRDC contracts, see list below];
5. It has, or is expected to have, a long-term relationship with its sponsoring agency (usually at least 5 years);

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[10] Report of Special Study Group on Federal Contract Research Centers (FCRCs). Office of the Director of Defense Research and Engineering, Washington, D.C., Aug. 30, 1971. p. 9.

[11] For further information regarding Federal guidelines on establishing FFRDCs, see Office of Federal Procurement Policy, OFPP Policy Letter 84-1.

6. Most or all of its facilities are owned by, or are funded under contract with, the Federal Government; and
7. It has an average annual budget (operating and capital equipment) of at least $500,000.[12]

There are four categories of FFRDCs: research laboratories, R&D laboratories, study and analysis centers, and systems engineering/systems integration centers. Each of the different types of centers is administered by either an industrial firm, a university, or a nonprofit institution. Most of DOD's FFRDCs are allowed to do some work for other Federal agencies. However, as a sponsor, DOD provides at least 70 percent of their budgets.

Currently, DOD supports nine FFRDCs with a total estimated FY 1986 budget of over $800 million. In 1984 and 1985 DOD added three new FFRDCs, the Software Engineering Institute (SEI) at Carnegie Mellon University, the Logistics Management Institute in Bethesda, Maryland, and the RAND OSD/Office of Joint Chiefs of Staff in Santa Monica, California.

DOD's nine FFRDCs fall into three of the four FFRDC categories: one R&D laboratory, five study and analysis centers, and three systems engineering/systems integration centers (see list below). DOD's only R&D laboratory is the Lincoln Laboratory at the Massachusetts Institute of Technology. R&D laboratories sponsor various types of research and development programs. Although Lincoln Laboratory focuses on advanced development research involving limited research facilities, most of the Federal R&D laboratories (of which the Department of Energy (DOE) operates 18 of the 20) have access to major national research and/or testing facilities.

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[12] Federal Funds for Research and Development: Fiscal Years 1983, 1984, and 1985. v. XXXIII, National Science Foundation. NSF 84-336. p. 2.

The five DOD study and analysis centers are involved in analytical activities in which no hardware-related laboratory research or development is carried out. These study centers were established to provide the OSD and the different services with help in solving organizational or operational problems of importance to DOD.

DOD's FFRDCs*

	Funding FY83 ($ millions)
R&D Laboratory	
Lincoln Laboratory/Air Force	285.0
Study and Analysis Centers	
RAND OSD/OJCS	20.0 (FY86) a/b/
RAND Project Air Force/Air Force	16.7
Center for Naval Analysis/Navy	18.5
Institute of Defense Analysis/ OSD	18.1
Logistics Management Institute/ OSD	9.0 (FY86) a/
Systems Engineering/Systems Integration	
Aerospace Corporation/Air Force	241.5
C3 I Division of MITRE/Air Force	190.3
Software Engineering Institute/Air Force	11.4 (FY86) a/

* Source: Federal Funds for Research and Development: Fiscal Years 1983, 1984, and 1985. v. XXXIII, National Science Foundation. NSF 84-336. p. 36.

a/ Centers established in 1984 and 1985. Figures provided by DOD.

b/ Included within this center is the Army's Arroyo Research Center operated by RAND. The Army is currently attempting to have this center classified as a separate FFRDC by the DOD. Of the $20 million budget, Arroyo's portion for FY 1986 is $8.5 million.

Systems engineering/systems integration (SE/SI) centers primarily provide systems engineering, R&D systems integration, and management support for definition and development of large technical systems.[13] DOD organized these centers because it lacked certain in-house capability in large systems development, integration and verification. Further, DOD feels that such capability is not readily available in the private sector without problems of conflict of interest.

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[13] Ibid., p. 2.

If the SDIO FFRDC is established, it probably would be placed within either the study and analysis or systems engineering/systems integration category with SDIO operating as the contract monitor and evaluator. The decision on which category a new FFRDC is placed is DOD's and is not critical prior to its establishment.

Congressional Concerns

For many years FFRDCs have attracted the attention of Congress. In their early years of operation, Congress' primary concerns regarding FFRDCs centered around growth, cost to the government, agency control, and quality of products. In the last decade, congressional concerns have focused on the centers as captive organizations insulated from certain aspects of a competitive environment, such as peer review and incentives for increasing cost efficiency. The 1983 report of a Federal Laboratory Review Panel (the Packard Report) found that many labs, including FFRDCs, had lost their sense of overall mission, which in most cases resulted in poor long term research and development planning.[14]

Critics in Congress and in the scientific community have also been concerned about the level of influence some of the DOD's FFRDCs have in DOD's overall Research, Development, Test and Evaluation (RDT&E) decision making. For FY 1986, FFRDCs comprised a little more than 2% of DOD's RDT&E budget. However, these centers either directly or indirectly will greatly influence the future direction of some of DOD's RDT&E programs, as well as related hardware procurement.[15] For example, the primary mission of the recently established Software Engineering Institute (SEI) is to "be a credible advocate for new technology, a visible standard of excellence for DOD software engineering practices, and a stimulus and guide to the entire defense community. The institute shall . . . promulgate use of modern techniques and methods throughout the mission-critical systems community."[16] In 1985, the Pentagon spent about $11 billion on "mission-critical" software for weapons systems. In fact, the Electronic Industries Association projected "that by 1990 the amount will be more than double, accounting for roughly 20% of everything the Pentagon spends on weapons."[17] Clearly, if the SEI fully follows its stated mission, the Institute could influence billions of dollars of software research and development throughout DOD.

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[14] Report of the White House Science Council. Federal Laboratory Review Panel, Office of Science and Technology Policy, May 1983. Washington, D.C. p. 4.

Since FFRDCs are primarily established to influence DOD's thinking about various R&D problems, such influence is not necessarily bad. However, critics contend that, too often, FFRDCs can influence the direction of DOD's R&D programs in the absence of congressional oversight and scientific peer review over the information and analysis provided by the center.[18]

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[15] This issue was discussed in an article entitled, Future of Federal Contract Research Centers, by Dean C. Coddington and J. Gordon Milliken, Harvard Business Review, v. 48, Mar.-Apr. 1970, p. 106. In a recent phone conversation (May 28, 1986), a representative from the Federation of American Scientists contends that the Software Engineering Institute (with an annual budget of around $20 million) may have a disproportionate influence regarding the direction of some of the Nation's most important future software research and development.

[16] Press release, DOD Establishes Software Engineering Institute. Nov. 14, 1984, No. 588-84.

[17] A Growing Gap In Software. Fortune, Apr. 28, 1986. p. 133.

In the course of both congressional and non-congressional analyses of all FFRDCs (including DOD's) a number of advantages and disadvantages regarding their establishment and operations have emerged. A brief review follows:

Advantages

1) Ability to attract and retain high quality staff members.

The Packard Commission study on Federal laboratories noted that "the inability of many Federal laboratories—especially those under Civil Service constraints--to attract, retain, and motivate qualified scientists and engineers is alarming."[19] FFRDCs are not constrained by the Civil Service salary and promotion system. Consequently, these centers are able to attract more qualified personnel and pay them at competitive market rates. A 1976 Defense Science Board Study noted that FFRDC professionals holding advanced degrees were roughly twice as likely to have doctorates as professionals within DOD in-house laboratories.[20] According to DOD this ratio has not changed much in the last decade.

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[18] This issue was also discussed in the Packard Report. The White House Science Council.

[19] White House Science Council. p. 6.

[20] Report of the Defense Science Board. Task Force on Federal Contract Research Centers. Office of the Director of Defense Research and Engineering, Washington, D.C. Feb. 1976, p. 22.

2) Ability to maintain objectivity and avoid conflicts of interest.

Because FFRDCs neither perform outside research nor have agency mission responsibilities they are more capable of total objectivity in conducting their assignments. The concern of objectivity is important for systems engineering and systems integration FFRDCs since they are making future procurement recommendations for various DOD weapons systems. Further, those supporting FFRDCs contend that they have fewer self-serving motivations than industrial concerns or even nonprofit diversified research organizations. Consequently, the FFRDCs do not continually seek funding for new research assignments, but rather focus their attention on the research and management problems of their sponsor.

3) Intimate familiarity with the sponsoring agency's activities and needs.

FFRDCs might be essentially considered a research and management consultant that has had a long term relationship with an individual client. Each year the FFRDC negotiates with DOD the center's activities. This allows the Pentagon to communicate with each center their particular priorities for that year and any recent changes in their research and development needs.

4) Ability to provide immediate communication of R&D results.

Most of the FFRDCs attempt to make sure that the results of their research work are effectively communicated within the sponsoring agency. For example, top management of the FFRDCs are often asked to brief Pentagon officials on the findings of their research. Further, initial publication of research findings is only available to DOD. Once DOD has reviewed the findings, the unclassified results of the study might be released to the public.

5) Quick response to sponsor's needs.

Regardless of the RDT&E need, the FFRDC provides DOD with the capability of rapidly assembling a competent research team when the Pentagon has limited internal talent and must quickly meet an urgent need. Further, while conducting a long term research program, many FFRDCs are asked by their sponsor to take on certain critical research and development problems. Their close relationship enables the FFRDC to provide assistance quickly and capably.

Disadvantages

1) FFRDCs are more costly to operate.

Critics contend that FFRDCs have no incentives to control their costs since they are generally nonprofit, obtain yearly funding, and do not have to compete for work in the normal peer review process. FFRDCs are often criticized because of the high salaries that they pay to middle and top management. FFRDCs were originally established during and after World War II, because the Pentagon needed such organizations in order to satisfy scientific requirements that could not be met in the private sector. However, the Professional Services Council (PSC), an organization representing private sector professional and technical services firms, contends that any new FFRDC, "will duplicate extensive capabilities already existing in the private sector. These private sector capabilities are available on an independent, competitive basis, and normally at a lower overall cost to the government."[21]

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[21] Letter from Virginia Littlejohn, Executive Director, Professional Services Council. Apr. 21, 1986. p. 3. Some of PSC's members are currently under contract to SDIO.

2) Assuming too much federal policy influence.

Some of the policy responsibilities of the FFRDCs concern some scientists and Congressional members, who argue that these centers often perform federal policymaking functions. Consequently, critics claim that FFRDCs exercise undue influence on important scientific decisions without direct public accountability. As was indicated earlier in this report, FFRDCs often make critical research and development recommendations to the Pentagon which could have significant consequences for future RDT&E programs and overall DOD procurement decisions.

3) Lack of a competitive environment impairs the quality of work.

Continued financial support and minimal competitive forces in the awarding of work assignments make FFRDCs suspect by those who feel that top performance cannot be stimulated in such an "insulated environment." The Packard report noted that one of the most serious deficiencies of many Federal laboratories, including FFRDCs, is their lack of accountability. The report stated that the labs "are not subject to the competitive driving forces of the peer review system as the universities are. Nor has their survival depended on satisfying the cost effectiveness and relevance constraints of industrial R&D laboratories."[22] Often the Federal lab review process focuses on the evaluation of proposed work and its cost, rather than on the actual quality of the work performed. As a result, "there are many opportunities for low-quality research in pedestrian subjects or in areas inappropriate for government involvement."[23]

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[22] Report of the White House Science Council. Federal Laboratory Review Panel. May 1983. p. 9.

4) Adverse effects on federal in-house laboratories.

Because FFRDCs are not governed by Civil Service hiring procedures and pay scales, some of the best scientists within the in-house Federal labs may well be hired away by the different centers. Further, within the scientific community, FFRDCs are often perceived as being involved in more scientifically challenging work. Consequently, it is argued that DOD's in-house labs lose some of their best scientific talent to FFRDCs, thus weakening their in-house research capabilities. This situation can have a demoralizing effect on the in-house labs as FFRDC personnel are perceived as "quasi super civil servants" who perform governmental functions, but are not subject to strict governmental accountability.[24]

5) FFRDCs have an unfair advantage in obtaining federal R&D work.

Many nonfederal R&D organizations, both profit and nonprofit, feel they are qualified to do some of the work currently carried out by FFRDCs. Both profit and nonprofit organizations contend that the long term relationship between FFRDCs and their sponsors often results in the assignment of tasks that should be open to the competitive environment. The Professional Services Council stated "that many of the primary sponsors of these FFRDCs are increasingly concerned about FFRDC activities that expand outside the intended scope of their original mission." For example, the Council contends that "the

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[23] Ibid., p. 9.

[24] The Nonprofit Research Institution. Harold Orlans, Carnegie Commission on Higher Education. McGraw Hill, New York, 1972. p. 135.

C^3I division of Mitre Corporation was set up to support the Electronic Systems Division of the Air Force, and yet a recent, multi-million dollar award was made to Mitre through this Air Force FFRDC to provide system engineering support to the FBI's National Crime Information Center. This work could have been done in the private sector."[25]

The above advantages and disadvantages of FFRDCs, in general, have been re-iterated by various proponents and critics in the context of SDII. The following section of this report specifically addresses the SDII proposal.

ANALYSIS OF THE SDII PROPOSAL

Federal policy dictates that prior to establishing an FFRDC, the sponsoring agency shall ensure that "existing alternative sources for satisfying agency requirements cannot effectively meet the special research or development needs."[26] As mentioned above, DOD conducted an internal evaluation for this purpose. CRS not have access to DOD's internal evaluation report, but written and oral summaries were provided.[27] The following sections of this report discuss DOD's conclusions and some of the issues raised by their decision to establish the SDII. CRS' analysis did not consider whether the functions to be performed by the SDII (primarily research evaluation and system integration) were necessary to the SDI program.

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[25] Letter from Virginia Littlejohn.

[26] OFPP Policy Letter 84-1. p.4.

[27] Personal conversation with Richard Sybert on Apr. 15, 1986.

Assessing The Options

The DOD considered three types of organizations for conducting the prescribed tasks: 1) government organizations, 2) private for-profit organizations, and 3) non-profit organizations. In assessing the various options, DOD decided that a single entity would be required over a minimum five year period to provide the necessary level of continuity. DOD also decided that it wanted an organization that would be dedicated exclusively to the mission described in The Federal Register of March 18, 1986 and not have any other contracts from either SDIO or other organizations doing work for SDIO.

The Government Agency Option

Within this category, DOD considered augmenting SDIO, enhancing another existing DOD agency, and establishing a new DOD agency. DOD recognized that a government organization would have ready access to sensitive information, be freer from business-related conflicts of interest, and not require time and money spent on preparing and negotiating contract proposals. However, all three possibilities under this option were rejected for the following reasons:

- The inability to attract and retain sufficient, well qualified personnel due primarily to the lower salaries associated with being a government employee (it was also feared that pooling the current talent within DOD into one organization, like SDIO, would severely drain other military service elements);
- The lack of flexibility in the Civil Service ranks for making expedient and expeditious changes in personnel; and
- Actual or perceived bias in evaluation of technologies and concepts under investigation by SDIO given the vested interests of the different armed services.

The Private For-Profit Option

The technical strength and responsiveness of the private sector to SDI needs are valued by SDIO/DOD. However, DOD does not believe that industry is well suited to providing the services described above for the following reasons:

- o Individual firms possess very focused technical capability rather than the broad spectrum of skills that are required for these tasks;
- o Access to proprietary information is limited and presents complications, not all of which can be foreseen and accounted for in the initial contract;
- o The potential for conflict of interest is unacceptable to SDIO; and
- o Periodic re-competition of contracts would be required by law, introducing the possibility of a loss in desired continuity.

The Professional Services Council (PSC) is highly critical of DOD's findings in this area. They contend that the capability, or at least the flexibility to attain the capability, exists in the private sector to comply with SDI's evaluation and system integration needs. Furthermore, they contend that "the majority of services sector firms are independent, meaning they are not captives or affiliates of hardware producing companies," and that these firms "routinely accept exclusion clauses in their contracts to avoid any conflict of interest."[28] DOD has made reference to the notion that the level of exclusions required in this instance would have negative business impacts, and therefore, would not be acceptable to any private firm.29 PSC does not believe this to be the case.30

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[28] Letter from Virginia Littlejohn.

The Non-profit Option

Within this last category, DOD considered existing FFRDCs, national laboratories and university study groups, and a new FFRDC. In general, these types of organizations were found to rank high in technical competence, responsiveness, real-time accessibility to sensitive data, and freedom from profit-related conflicts of interest. However, the existing organizations were rejected for the following reasons:

- o Real or perceived bias resulting from vested interests in other ongoing SDI research; and
- o A lack of flexibility in getting top scientific personnel on board and organized quickly into an existing management framework with an independent mission, given that none of these organizations were found to already possess the breadth of technical expertise required.

DOD decided that establishing a new FFRDC was the proper course of action since, in addition to the advantages of being a non-profit organization, it would be free from the two problems described above. Critics of the SDII proposal claim that existing FFRDCs were rejected because of recent reports from some of their members that are critical of various SDI concepts or technologies. Nonetheless, the two problems stated above would need to be

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29 From a letter to Senator Carl Levin from Lt. General James A. Abrahamson dated Apr. 16, 1986, regarding DOD's evaluation of the need for an FFRDC to support SDIO.

30 Telephone conversation with Neville Hunter of Veda, Inc., chairman of the PSC task force on FFRDCs, on May 6, 1986.

resolved. Furthermore, if the SDII is truly independent of SDIO, it too is likely to be critical of certain SDI concepts and technologies, so, in theory, SDIO cannot hide from technical criticism merely by establishing a new organization to perform the desired functions.

Policy Considerations for SDII

Given DOD's stated mission (of technology evaluation and system integration), desired organizational characteristics (of being competent, continuous, and conflict-free), and institutional constraints (especially their purported inability to hire enough qualified people in-house), the decision to establish a new FFRDC is consistent. However, the validity of DOD's assumptions can be questioned. Additionally, several issues remain requiring clarification or resolution.

First, since the mission proposed for the SDII requires such great depth of knowledge across the entire spectrum of technologies and concepts associated with SDI, it appears doubtful that any single organization can acquire all of the top personnel required to adequately perform all of the stated functions over five or more years of its existence. If it can not, how will the work be done? Will ad hoc panels be established for certain tasks? Will subcontracting be required and allowed? If so, then what is really to be gained by setting up an organization once removed from SDIO in the first place? And, how then will SDII studies be sheltered from interest conflict and bias?

Second, DOD's determination that technology evaluation and system integration be conducted outside of SDIO is troubling to some critics. They are concerned that this could have a serious effect on SDIO's ability to make independent technical program policy decisions. In effect, SDIO could be yielding to SDII the kind of undue influence that has caused congressional concern over past FFRDCs (see above).

SDIO is responsible for ensuring that its FFRDC does not exert undue influence over program policy decisions. It has been clearly stated by DOD that all program decisions will continue to be made by SDIO officials. However, many critical decisions will depend on information that is supplied by the SDII. DOD, in their evaluation, cast some doubt about the breadth of SDIO's in-house technical capability. This doubt raises the question of what SDIO expertise and mechanisms will exist to monitor SDII activities and quality of research? Furthermore, it is not yet known if and how the SDII will be held accountable to the scientific community outside of SDIO.

Third, the relationship between the SDII and the National Test Bed will require careful consideration. Currently, no distinction has been made between SDII's role in using test bed results to evaluate SDI concepts and technologies and its role in evaluating the test bed itself. The relationship will be complicated because, according to DOD, SDII will assess and help to develop evolving technical requirements, architectures, and their related test bed needs, as well as perform test and evaluation planning. Consequently, SDII's mission could drive much, if not all, of the test bed's activities.

Fourth, SDIO does not plan to allow the SDII any money in its budget for initiating its own related research. Such contract provisions for other FFRDCs are intended to encourage innovation and provide a means for funding studies designed to resolve conflicts among researchers over conclusions drawn from requested studies.31 The claim has also been made, but not proven, that the ability to initiate studies helps to attract top scientific talent to the organization. SDIO would prefer that all studies be generated by SDIO research directors, with budgets and programs to be negotiated with SDII at maximum six month intervals. Although SDIO's desired degree of liaison and coordination is to be commended, the idea of setting aside a portion of SDII's budget for independent studies should be considered.

Fifth, some Members of Congress are seriously concerned over the level of SDIO influence in the hiring of SDII's management and technical personnel. Although a contract has not yet been negotiated on this matter, SDIO appears to favor greater than normal personnel input compared with existing FFRDCs. This may not be in the best interests of SDIO for two reasons: 1) its perceived introduction of bias and control over research results, and 2) its potential for merely shifting SDIO personnel into positions of higher salary without concomitant increases in responsibilities. However, it should be noted here that it is not DOD's intention to establish any organization that is unsympathetic to the vision behind SDI; rather it is DOD's intention to establish an organization that is unbiased in its evaluation of which technologies and system concepts are best suited to meet SDI objectives. It should further be expected that this distinction will be reflected in the personnel finally chosen for positions within SDII. Nonetheless, SDIO probably has something to gain in image and avoidance of criticism and little to lose by

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31 For example, the Center for Naval Analysis (CNA) in Alexandria, Virginia has approximately 24 percent of its budget devoted to independently initiated studies. This example is for illustrative purposes only and is not an endorsement of a particular budget allocation.

yielding to these personnel concerns by allowing SDII management to have total control over hiring.

And sixth, the degree to which DOD would rely on the SDII for information and analyses of defense policy issues is unclear. Will SDII be engaged in studies to help determine strategic defense deployment strategies? Will they be involved in analyses regarding U.S. options for treaty compliance? Should the SDII be involved in these kinds of studies, particularly if it must accept the vision behind SDI rather than be free to question it? Although it is recognized that some overlap will necessarily exist between technical and defense policy studies, Congress may wish to seek additional clarification of these responsibilities for SDII.

REPORT TO THE CONGRESS
ON THE
STRATEGIC DEFENSE INITIATIVE

APRIL 1987

Prepared by the

Strategic Defense Initiative Organization

APPENDIX E

THE NEED FOR A FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTER (FFRDC)

BACKGROUND

The mission of the Strategic Defense Initiative Organization is to objectively assess technical questions relating to strategic defense to provide the President and the Congress with the necessary information to reach a national decision on strategic defense. This includes conducting a long-range, directed research program toward what may be an extremely complex and far-reaching system. The requisite research is correspondingly complex. Programs must be carefully crafted to strike the right balance among pure research, applied experiments, development of research results, and feasibility demonstrations.

The SDIO does no research itself; it is the managing agent for the SDI research program. This by itself is a significant task. A great variety of individual, parallel research efforts must be directed and coordinated to produce integrated results. A common data base must be maintained to avoid unnecessary overlap or duplication of efforts and to facilitate cross-information between research projects. In addition, design development and definition of the system architecture requires ongoing, continuous study and analysis, including cost, technology, and performance trade-offs among system elements.

The SDIO requires technical support in these areas to properly carry out its SDI program management functions. The accelerating rate of research and the evolution of the Program require that the SDIO focus on actual program management and that the necessary technical support, evaluation, analysis, and integration be provided on a long-term, continuous, conflicts-free basis rather than in a piecemeal, ad hoc manner. There is an immediate need for continuous access to the highest-quality engineering and scientific talent to provide dedicated support to the SDIO.

The Senate Armed Services Committee Report on the Defense Authorization Act for FY87 confirms the SDIO need for this technical support:

> [T]he Committee does recognize the need for such support in carrying out the system trade-offs and system integration efforts required to manage a program as complex as the Strategic Defense Initiative. Therefore, the Committee strongly endorses the establishment of à means to provide technical support, such as was provided to the Air Force's intercontinental ballistic missile (ICBM) development effort by the Aerospace Corporation.

ALTERNATIVES AND DOD EVALUATION

On 1 March 1986, the Department of Defense completed an evaluation of the alternatives for satisfying the requirement. The alternatives examined were:

- Government organizations, including expansion of the present SDIO staff; a military Service organization; or a new DoD field agency.
- For-profit firms, including large industrial firms; small- to mid-size System Engineering and Technical Assistance (SETA) contractors; or a new consortium of such firms or contractors, either U.S. or foreign.
- Non-profit firms, including existing Federally Funded Research and Development Centers (FFRDCs); a new division within an existing FFRDC; a new FFRDC; universities; and private not-for-profit laboratories/corporations, new or existing.

The results of the evaluation can be summarized as follows:

- The use of a government organization to provide the special technical support needs of the SDIO was found to be undesirable because: (1) it would be difficult to attract, retain, and manage the required number of highly qualified scientific and engineering personnel, and (2) the needed personnel buildup could not occur or respond in sufficient time to meet changing requirements.

- The use of for-profit firms was found to be undesirable because of the conflicts of interest inherent in the for-profit organization the probable inability to ensure total objectivity and independence of thought, and the negative business impact on such a firm through its necessary dedication to SDIO technical support alone.

- Of the various not-for-profit alternatives examined, a new FFRDC ranked highest. The FFRDC mechanism was considered to offer quick, responsive handling of SDIO needs, while allowing considerable freedom in establishing salary structures and a working environment conducive to attracting the necessary scientific and engineering talent. While an existing FFRDC or other non-profit organization could, potentially, provide capabilities and staff more readily, none have the breadth of specialized expertise to undertake major SDI technology program review and oversight. Any existing organization, including an existing FFRDC or national laboratory will necessarily have ongoing work and a deeper background in one technology or another. In addition, no existing organization is in a position to offer the desired

> degree of dedication to and exclusive focus on the SDI Program. Establishing a new FFRDC specifically oriented to SDIO technical support needs was found likely to result in greater responsiveness and support than attempting to reorient an existing FFRDC.

Establishing a new FFRDC, free from commercial ties and dedicated exclusively to the SDI technical functions, is the best alternative to meet that requirement. Accordingly, the Defense Department moved to create a new FFRDC--to be called the Strategic Defense Initiative Institute (SDII)--with funds appropriated for the SDI Program. Originally, the goal for initial operation of the SDII was the end of FY 1986. The SDIO announced its intent to establish a new FFRDC in the Federal Register and the Commerce Business Daily with three sets of announcements over a 90-day period ending June 16, 1986.

CONGRESSIONAL ISSUES

As the DoD moved to create the SDII, questions about the decision to establish a new FFRDC surfaced. The SDIO, in response to letters to the SDIO Director, answered questions and addressed issues in several information briefings to professional and personal staff of the Congress, and is providing full disclosure of information when requested about the need for an intended mission of the new FFRDC. (Selected issues will be discussed later in this Appendix.)

Because of these issues, the DoD was cautioned against proceeding further to establish the new FFRDC by the end of 1986. Subsequently, legislation was enacted in the FY 1987 DoD Authorization Act and the Continuing Resolution prohibiting the new FFRDC until authorized with funding appropriated in separate legislation. Further, both the DoD and the Comptroller General were directed to provide detailed reports on the issues.

At the request of certain members of Congress, the Congressional Research Service (CRS) examined the actions to establish the FFRDC and reported (30 May 1986) pros and cons of the initiative. The central conclusion of the CRS report stated:

> Given DoD's stated mission (of technology evaluation and system integration), desired organizational characteristics (of being competent, continuous, and conflicts free), and institutional constraints (especially their purposed inability to hire qualified people in-house), the decision to establish a new FFRDC is consistent.

The Comptroller General evaluated (report dated 17 November 1986) the options and plans for SDI technical support. The Comptroller General's findings are entirely supportive of the selection of a new FFRDC to perform the needed technical support, ranking that option as first among eight alternatives in terms of effectiveness. (Tied for effectiveness with establishing a new FFRDC was a new division within an existing FFRDC/national laboratory, although many of the GAO sources offered disadvantages with that alternative.)

In response to draft legislation precluding establishment of the FFRDC until a full DoD report was prepared, a comprehensive report of alternatives was provided to the House and Senate Armed Services Committees on 8 August 1986. A full cost comparison analysis was completed and provided as a supplement to the report to the two Committees on 20 October 1986.

RESPONSE TO SELECTED ISSUES

This section discusses issues raised in recent Congressional Committee reports.

> (1) Whether or not existing Federally Funded Research and Development Centers, Federal research laboratories, and private contractors would be able to perform the stated objectives of technological integration and evaluation.

This issue was treated exhaustively in the DoD's 1986 study entitled "Assessment of Alternatives." The conclusion of that study, along with the supporting findings of the CRS and the GAO, has been mentioned already in this section. The need for absolute objectivity, conflicts-free advice, and absolute dedication to the SDIO, together with the fact that the vast bulk of SDI-related primary research will continue to be performed by outside entities including consultants and for-profit firms, make it clearly impractical and inadvisable to use an existing organization for this specific purpose.

In addition to these considerations, not one private organization appeared to have the breadth of expertise across all involved technologies to meet the needs of overall technical evaluation and integration for the SDI Program.

Finally, despite numerous inquiries, no private sector firm appeared willing to bid on or operate the FFRDC on the terms deemed necessary--exclusive dedication to the SDIO and no other SDI work--to guarantee the FFRDC objectivity and freedom from actual or apparent conflicts of interest.

It should be stressed that the bulk of primary SDI research will continue to be performed, as now, by other entities, including private consultants and other for-profit firms. We intend strictly to enforce the SDII's focus on its specific functions.

(2) Whether or not the proposed Federally Funded Research and Development Center will be required and allowed to subcontract research projects to other Federally Funded Research and Development Centers, Federal research laboratories, and private contractors.

It is possible that the SDII may subcontract in appropriate circumstances. However, the SDIO and proposers of the SDII believe that the SDII, over time, will be successful in attracting the necessary personnel to avoid any great frequency of subcontracts.

Furthermore, the SDII should not be awarding any research subcontracts, as the Institute will not be undertaking primary research on major experiments itself, with the possible exception of updating and refining overall system architecture. The primary role of outside entities in performing basic SDI research should remain undisturbed. If a particular issue does require a special panel or outside contractor, the SDII should still possess sufficient expertise and perspective on overall system integration and evaluation to maintain its ability to monitor and review such work. The SDII's intended functions are evaluating and integrating research, not actually doing or contracting the research.

(3) Whether or not the contract to operate the proposed Federally Funded Research and Development Center will be awarded on a competitive basis.

The SDIO is proceeding on other than a formal competitive basis pursuant to its authority under the Competition in Contracting Act (CICA), "to establish or maintain an essential engineering, research, or development capability to be provided by an educational or other non-profit institution or a federally funded research and development center," 10 U.S.C., Sec. 2304(c)(3)(B). The SDIO has determined that, in the particular circumstances of this case, its immediate technical support needs would not be met by a full, formal procurement, which in the case of the most recently established DoD-sponsored FFRDC (the Software Engineering Institute at Carnegie-Mellon University) took almost a year to complete. Rapid progress in research, coupled with intensive Soviet efforts in strategic defense, make providing this additional support to the SDIO time critical.

Accordingly, a number of prominent scientific and technical figures have been invited to submit a proposal to operate the SDII. Many of these persons are also members of the SDI Advisory Committee (SDIAC), a not-for-profit consultative group of private citizens who make available their scientific and technical expertise to the SDI Program. SDIAC members are probably the most qualified people to establish the SDII: they are intimately familiar with the SDIO's technical support needs and the scope and direction of the Program.

It should also be noted that no commitment has been or will be made until the indicated proposal has been received, reviewed, and evaluated. As noted, the SDIO has been contacted by several companies and individuals in response to the series of announcements of DoD's intent to establish the SDII. However, most callers have indicated their inclination not to proceed when advised of the conflicts-of-interest requirements which dictate that the SDII have no other SDI-related work nor have other clients who themselves have such work. The SDIO has received no proposals, other than the invited proposal, to operate the SDII. It appears, therefore, that there exists only one responsible source for this work within the meaning of Section 2304(c)(1) of the CICA. The SDIO has received one SDII-related proposal to provide interim technical support until the SDII is effectively operational; SDIO has responded that it would consider the proposal should such a need become apparent.

> (4) Whether or not all proposals to operate the proposed Federally Funded Research and Development Center will be considered by the appropriate Defense Agency and whether or not such proposals will be subjected to peer review by persons outside the Government.

All proposals to operate the SDII will be considered fully and fairly by the SDIO and the appropriate defense agency. There are no present plans to enlist "peer review by persons outside the government" in this process. The SDIO believes it has the appropriate resources and personnel to best evaluate proposals to operate the SDII. SDIO personnel are most familiar with the status of the SDI research program and the SDIO's particular needs for technical support. The SDIO Deputy Director for Systems and Programs will chair an evaluation board consisting of SDIO Technology Office Directors. This management team has insights into the needs of the SDI Program to assess any FFRDC management proposals that may be received. If additional outside review is needed, it will be considered at that time.

> (5) Whether or not the proposed Federally Funded Research and Development Center will be designed to prevent even the possibility of conflicts of interest by prohibiting any officer, employee, or member of the governing body of the proposed Federally Funded Research and Development Center from holding any position with one of the following:
>
> (a) The Strategic Defense Initiative Organization.
>
> (b) The Strategic Defense Advisory Committee.
>
> (c) Private research centers with a substantial interest in the development of the Strategic Defense Initiative.
>
> (d) Any other entity with a function or purpose similar to a function or purpose of one of the entities named in subparagraph (a), (b), or (c).

Pursuant to Executive Branch Policy (Office of Federal Policy Letter 84-1), the SDII will be required to operate "free from organizational conflicts of interest." The SDII will not be permitted to have any other SDI-related work beyond its specific technical functions, nor to serve other clients who themselves have SDI or SDI-related work. This is necessary because it is expected that the SDII will provide advice, recommendations, and evaluations to the SDIO that as a practical matter may impact upon the latter's decisions to award federal research and development contracts to other entities (the SDII will have no formal or legal role in such awards, as all management and decision responsibility will continue to be exercised by the SDIO). In addition, in the course of its research and evaluation function, the SDII may undertake research audits of other entities, including other FFRDCs and national laboratories, that are performing research for the SDI Program.

Regarding individual SDII personnel, it is possible that in isolated instances and as a temporary measure, individual technical personnel from the SDIO may be stationed at the SDII to fill an immediate need. There would be no apparent conflicts of interest between the two organizations as the purpose of the SDII is to meet the technical support needs of the SDIO. The SDIO does intend to require that SDII personnel not be permitted during their tenure at the SDII to hold any position with any other organization that has any financial interest in SDI work. The SDIO also expects to incorporate in the sponsoring agreement the appropriate provisions to ensure SDII employees would safeguard information owned by other contractors.

It is possible that some SDII directors may also be SDIAC members. Both positions are uncompensated apart from expenses. However, to avoid any actual or apparent conflicts of interest, it is the intent that such persons will not participate in any evaluation or advice by the SDIAC regarding the SDII. The sponsoring agreement will provide for a 50% maximum limitation on the FFRDC governing body to simultaneously hold positions on the SDIAC.

Regarding post-employment practices, as a nongovernment organization, an FFRDC is not legally subject to the post-employment restrictions that apply for federal employees. Upon additional investigation and inquiry of counsel, the SDIO has been further advised that it would not be appropriate to impose "revolving door" provisions on FFRDC employees.

Concerns in this area appear related to potential involvement of the SDII in review of research proposals. However, SDII functions will be primarily oriented to evaluating research results. When government activities do require the service of a contractor to review proposals submitted by private firms, financial disclosure statements will be obtained from the reviewing contractor and its agreement to safeguard proprietary information. The SDIO intends to require that this practice be followed by the SDII as well.

> (6) Whether or not the sponsoring organization will have any role or influence in the selection of the staff of the proposed Federally Funded Research and Development Center below the head of such center and what that role or influence, if any, will be.

There will be no SDIO participation in search, screening, or selection of SDII management or staff. The sponsoring agreement will require only that the Institute's president and the heads of its several technical directorates be acceptable to the SDIO Director. Specifically, concurrence will be required by the SDIO Director for the top-level executive (e.g., president) of the FFRDC, and coordination with the appropriate peer directors will be required in the selection of the key FFRDC technical personnel. The SDIO will not have veto power over the FFRDC's staff selection except for that of president. The SDIO intends only to seek review and comment authority for other organization officers and senior technical directors of the FFRDC's staff.

Such approval of the handful of key FFRDC personnel is neither new nor unusual. For example, the agreement between the Center for Naval Analysis (CNA) and its sponsoring agency, the U.S. Navy, provides that the Center's president and other top officers, including the directors of its various operating divisions, be subject to approval of Navy representatives. Other FFRDCs also routinely subject their president to the approval of the sponsoring government agency.

The SDIO does not believe such a limited role will in any way adversely impact either the objectivity or the independence of the SDII. The SDIO, as the sponsoring government agency of the SDII, has a duty to ensure fully qualified key personnel for the Institute. To carry out properly its technical support mission, it is imperative that SDII personnel possess the highest professional qualifications and that there be effective communication and liaison between top management of the two organizations.

There has also been some criticism that the SDII plans to have a "mirror image" structure to the SDIO, and that it should be divided into technical elements (e.g., directed energy, kinetic energy) to correspond to those of the SDIO. This is only a suggestion. Since the SDII is an independent entity, it can determine its own structure. This clearly makes sense, given the close working relationship and the need for effective liaison between the two organizations.

(7) Whether or not a prescribed minimum percentage of the annual budget of the proposed Federally Funded Research and Development Center will be set aside and devoted exclusively to independent research to be conducted without regard to the preferences or desires of the sponsoring organization.

The SDIO agrees that the ability to initiate related research and studies is valuable and should be explored. While the SDIO cannot commit in advance to any fixed portion of its budget being devoted to independent studies, it agrees that some flexibility should be built into the Institute, and the SDIO will explore contract provisions in negotiation toward that end.

The new FFRDC will primarily be a systems engineering/system integration (SE/SI) organization as opposed to one devoted to studies and analyses. However, studies and analyses are an essential part of SE/SI activity and therefore are not mutually exclusive. When analyses are conducted as a part of the technological or development planning of the organization, it becomes an appropriate activity for the SDII to perform. Analyses and studies are necessary in the early stages of the SDI Program.

POLICY ROLE

The SDII will be a purely technical support group. The SDIO will retain all management and decision responsibility for the SDI Program. The SDII is being established for a very specific purpose--to provide scientific and technical support to the SDIO for evaluating and integrating research. The SDII is not to perform any oversight or policy functions. Those functions, in whole or part, are the role of other organizations, including the Congress. As described in OFPP Policy Letter 84-1, supra, the purpose of an FFRDC is to provide support to its sponsoring agency. Neither the SDII, nor the SDIO itself, will be making national policy decisions on strategic defense. Their mission is to provide objective technical and feasibility data.

To meet these technical support needs and provide the SDIO with objective, conflicts-free advice, the SDIO judged it best to opt for a new organization exclusively dedicated to these narrow functions. No particular bias or point of view is being sought. Obviously, there must be a commitment to exploring fully and fairly the possibility and technical feasibility of strategic defense. That is the purpose of the SDI Program, and given Soviet efforts in this area and the right of any government to protect its people, it would be imprudent not to do so. There is no intent to assure a predetermined view. As noted in the CRS report, supra, "it is not DoD's intention to establish any organization that is unsympathetic to the vision behind SDI; rather it is DoD's intention to establish an organization that is unbiased in its evaluation of which technologies and system concepts are best suited to meet SDI objectives" (p. 22, emphasis in original).

The SDII will be independent in the sense that it will be self-managed and will provide objective, conflicts-free support, recommendations, and evaluations to the SDIO. It is not intended to be "independent" in the sense of having its own agenda or policy role, nor would that be proper. Though there will be close liaison between the two organizations, there is no reason to believe that such a working relationship will lead reputable scientists to compromise objectivity or independence.

The requirements that the SDII submit work plans every 6 months and that its work proposals be subject to SDIO approval are reasonable to ensure that the new center fulfills its stated purpose, meets the SDIO's technical needs, and maintains a proper focus on its specific functions without encroaching the private sector or other organizations. The SDIO is not averse to contract provisions that permit the SDII flexibility to initiate its proposals, but it is not reasonable to commit a fixed percentage of its budget to such ends, particularly in light of the history of severe cutbacks in requested SD funding.

COST COMPARISON

Approach

To gain insight on the costs associated with a new federally funded research and development center, a cost comparison has been made of the actual costs associated with existing FFRDCs versus those of a for-profit SE/SI firm versus those of a DoD laboratory. In conjunction with this analysis, an estimate of the costs associated with establishing a new FFRDC for the SDIO will be discussed.

Comparisons are based upon the cost per MTS, or member of the technical staff. The acronym MTS is a historical designation for select technical professionals who provide the scientific and engineering expertise required in Scientific and Engineering support contracts, including FFRDCs. Although the term has never been equivalent in meaning between any two contracts, an MTS has been described as a professional scientist or engineer actively and directly engaged in performing the development planning, system engineering, research and experimentation, and technical support. MTS is the basic unit of measurement for stating technical manpower requirements. The mix of education levels, years of experience, functional specialties, and even the number of hours per year that constitute one MTS may differ from place to place.

Source

Air Force Headquarters prepared a report entitled "Acquisition Management Review of Scientific and Technical Support Contracts," dated 1 August 1986. The cost data used in this appendix on FFRDC and SE/SI contracts and establishing a new FFRDC are from this Air Force report as is the approach used in developing the cost data for the DoD laboratory.

Cost per MTS includes total contract costs divided by the number of MTSs. The composition of costs that comprise MTS total costs include: direct labor, travel, computer costs, consultants, facilities, outside procurement, overhead and fringes, other direct costs, and profits/fees. The Air Force made rough adjustments in the raw cost data to eliminate major anomalies in cost per MTS and normalize the manner in which given MTSs per year were calculated among contractors. Similar adjustments were made to the raw cost data for the DoD laboratory.

Alternatives

The following is a comparison of the adjusted cost per MTS for existing FFRDCs, a for-profit SE/SI firm, and a DoD laboratory using 1985 data; an explanation for the differences in cost per MTS of these alternatives; and a brief explanation of how each of these costs were developed:

1. Cost per MTS of Alternatives (1985 dollars)

- FFRDC

  Range: $134,000 - $180,000

  Average: $148,000

- SE/SI Firm (for-profit)

  Actual: $156,747

- DoD Laboratory (to represent the costs of an in-house SDIO adjunct)

  Actual: $143,340

2. Differences in Cost per MTS of Alternatives

There are several explanations for the differences in cost per MTS of these alternatives, particularly the FFRDCs and the SE/SI (for-profit) firms. SE/SI firms receive higher fees averaging 10 to 11% whereas FFRDCs receive on the average 0 to 4%. For FFRDCs, the government does not pay for depreciation on real property, thus the only source of money to these contractors for purchase of such assets is through profit retention or from other sources such as endowment funds. SE/SI firms, however, charge the government for depreciation on real property. To obtain government business, SE/SI firms additionally charge the government substantial bid and proposal costs, not incurred or passed on to the government by FFRDCs.

3. Development of Cost per MTS for Alternatives

FFRDCs. The 1985 figure from the Air Force report represents an average of five FFRDCs reviewed. The range of adjusted costs per MTS for the FFRDCs reviewed is $134,000 to $180,000. Those FFRDCs at the higher end of the scale include laboratories, organizations with a substantial proportion of PhDs included in the MTS, and organizations with larger support-employee to MTS-employee ratios.

SE/SI Firm (for-profit). The 1985 figure was developed by averaging the cost per MTS of two SE/SI for-profit contractors included in the Air Force report. The firms were chosen because they represent the kind of SE/SI support the SDIO's FFRDC would provide.

DoD Laboratory (to represent the costs of an in-house SDIO adjunct). The 1985 figure represents data gathered on the Naval Surface Weapons Center (NSWC), an industrially funded activity which provides technical support for the Navy and other defense activities that need technical products and services for ship combat systems, ordnance naval mines, and strategic systems. NSWC represents an in-house resource with significant MTS talent and a cost accounting system similar to that of a private firm. The figure represents what it might cost the SDIO for an adjunct from government resources to fulfill the mission of an FFRDC. Adjustments were made similar to those made by the Air Force to reflect an MTS composition approximating that of an FFRDC or SE/SI firm.

Estimate for New FFRDC

In the analysis of costs for existing alternatives, an average cost per MTS of $148,000 was derived for existing FFRDCs, with a range of cost per MTS of $134,000 to $180,000. Since the SDIO's FFRDC should have a large proportion of PhDs included in the MTS and a large support-employee to MTS-employee ratio, it is reasonable to conclude that the cost per MTS would be at the higher end of the scale. An estimate of $164,000 is midway between the average cost per MTS and the highest cost and represents a reasonable estimate of the cost per MTS for the SDIO's FFRDC in 1985 dollars.

The $164,000 figure does not consider startup costs. Startup costs are inherent when establishing any new organization, be it a new FFRDC, private firm, or federal research laboratory. These costs are difficult to estimate since they involve a number of variables including recruiting and hiring talented people and locating and obtaining facilities as well as the necessary equipment. Normally these startup costs dissipate over time. Included in the Air Force's review of FFRDCs was a newly established FFRDC whose cost per MTS was projected to stabilize after two years. Using this data and projecting for SDIO's FFRDC, the cost per MTS for SDIO's FFRDC would stabilize at $164,000 (in 1985 dollars) in the third year.

Summary

The data below make the following cost comparison for the various alternatives relative to establishing a new FFRDC for the SDIO:

Existing FFRDC	SE/SI Firm	In-house Adjunct	New FFRDC
$134,000-$180,000	$156,747	$145,340	$164,000

Although establishing a new FFRDC represents one of the highest cost alternatives, the benefits of a new FFRDC dedicated to the SDIO far outweigh any differences in cost.

United States General Accounting Office

GAO

Report to the Congress

November 1986

STRATEGIC DEFENSE INITIATIVE PROGRAM

Expert's Views on DOD's Organizational Options and Plans for SDI Technical Support

GAO

United States
General Accounting Office
Washington, D.C. 20548

Comptroller General
of the United States
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President of the Senate and the
Speaker of the House of Representatives

Pursuant to Section 213 (c) of the National Defense Authorization Act for Fiscal Year 1987 and to a request from the Senate Committee on Armed Services dated August 4, 1986, we are reporting on the Department of Defense's (DOD's) proposal for establishing a new federally funded research and development center (FFRDC) to provide the Strategic Defense Initiative Organization (SDIO) with technical support. The new FFRDC would be called the Strategic Defense Initiative (SDI) Institute. In preparing this report, we have obtained the views of a select group of individuals on various aspects of DOD's proposal.

DOD determined that SDIO needed to quickly augment its capability to assess technical questions regarding strategic defense. In November 1985, an ad hoc SDIO Technical Support Working Group was formed in response to a request from the Director of SDIO to identify and assess possible organizational approaches to provide SDIO with technical support. The working group developed a list of characteristics considered essential for the support capability. Based on these criteria, it evaluated eight possible organizational alternatives. The group concluded that the best option was to establish a new FFRDC. The other seven options were to establish a new division in an existing FFRDC or national laboratory; contract with an existing FFRDC or national laboratory; contract with a university; contract with a non-profit laboratory or corporation; contract with a for-profit firm, such as an industrial firm or consortium of such firms; expand the present SDIO staff; and establish a new DOD field or military organization.

The Office of Federal Procurement Policy's Policy Letter 84-1 provides government-wide guidance for establishing FFRDC. FFRDC are research and development organizations that provide technical advice to their government sponsor(s). FFRDC are not to perform research or development that might be better performed by industry, universities, or government agencies. Also, FFRDC are not to compete with industry for government contracts or to perform work for industry. FFRDC are to maintain their independence, objectivity, and freedom from external influences and, thus, are to be free of conflicts of interest.

DOD currently sponsors 10 FFRDCs: 1 research and development laboratory, 6 study and analysis centers, and 3 systems engineering/systems integration centers. Fiscal year 1985 funding for these FFRDCs totaled more than $757 million. Other government agencies sponsor an additional 26 FFRDCs.

According to DOD, the SDI Institute would support SDIO through technical evaluation and integration of existing and potential technological advances and system concepts. The Institute's staffing level would be expected to start at about 50 professionals and increase to about 150 to 200 professionals, with a maximum of about 300 professionals. Individuals would be recruited primarily from universities, existing FFRDCs, and industry. Funding is expected to constitute less than one percent of SDIO's total budget. (See app. I.)

Objectives, Scope, and Methodology

On August 4, 1986, the Senate Committee on Armed Services asked us to (1) evaluate alternative organizational approaches for providing SDIO with technical support, (2) evaluate the extent to which DOD's plans provide for an independent and objective FFRDC in conformity with government-wide policies for FFRDCs, and (3) determine whether any precedents exist whereby DOD has created a new FFRDC to provide technical support for a major research program. Subsequent to the Committee's request, Congress passed the National Defense Authorization Act for Fiscal Year 1987 (Public Law 99-661). The act requires the Secretary of Defense to provide a report to the House and Senate Committees on Armed Services. Section 213 (c) of the act requires us to report, as appropriate, on certain matters concerning the proposed new FFRDC. This report addresses

- the ability of various organizational approaches to meet SDIO's needs for technical support;
- the comparative cost of meeting the needs through the various organizational approaches;
- the primary function of the proposed new FFRDC;
- whether the center will be required or authorized to enter into contracts with others, including other FFRDCs, for research projects;
- whether the contract to operate the new FFRDC will be awarded on a competitive basis;
- the role of DOD in selecting staff and in organizing the new FFRDC;
- whether the new FFRDC's annual budget will have funds for independent research;
- whether the proposals to operate the new FFRDC will be subjected to peer review; and

- whether DOD's plans for the new FFRDC provide for an independent and objective organization free from conflicts of interest, including prohibiting (1) any officer, employee, or member of the governing body of the new FFRDC from holding any position with SDIO or an interested private contractor and (2) more than one-half of the FFRDC's governing body from simultaneously serving on the SDI Advisory Committee or similar body.

This report satisfies both the Committee request and the legislative requirement. It does not address the Strategic Defense Initiative itself.

In order to respond to the Committee's request, as agreed with Committee representatives, we obtained the views of a select group of individuals on the Committee's areas of interest. We agreed on this approach because (1) an evaluation of alternative organizational approaches can appropriately be performed by individuals with experience and close familiarity with the organizations, (2) government guidelines concerning a FFRDC's independence and objectivity are broadly stated and do not provide specific criteria with which to measure DOD's plans, and (3) given the absence of specific criteria, the views and experiences of individuals with knowledge of FFRDCs can provide insights on the acceptability of DOD's plans. This report is a compilation of views expressed by the select group of individuals contacted during our review and other materials we have developed.

We asked 11 consultants (see app. IV) with broad governmental, military, industrial, and/or academic experience, but with no involvement with the SDI Institute proposal, to

- evaluate the eight organizational options assessed by the SDIO working group;
- rate the options in terms of DOD's criteria for providing SDIO with technical support;
- rank the options according to effectiveness and cost; and
- assess the impact on the FFRDC's independence and objectivity of DOD's plans for selecting a contractor, evaluating proposals, and participating in staff selection.

In addition, we asked the presidents or heads of nine DOD-sponsored FFRDCs to express their views on the impact on the FFRDC's independence and objectivity of DOD's plans for staff selection, work plan approval, provisions for independent research, and conflict-of-interest and post-employment restrictions. Prior to meeting with the consultants and heads of the FFRDCs to discuss their views, we had them record their responses on data collection instruments that we designed. (See app. V.)

Ratings of Organizational Options

The consultants concluded that the SDIO needs technical support to oversee research program and systems integration efforts. They agreed with the SDIO working group's overall effectiveness rankings of the top two and bottom two organizational options for the SDI Institute. The consultants assigned their highest overall rankings to the option of creating a new FFRDC and a new division in an existing FFRDC. These organizational options tied for first in overall effectiveness. The consultants generally preferred the FFRDCs because of their proven records at (1) attracting high-quality personnel, (2) providing objective and independent assistance, and (3) safeguarding proprietary information.

The new FFRDC option scored especially well with the consultants on the criteria of independent, objective, and dedicated assistance. Six consultants rated it first and one consultant rated it second. Concerns were expressed about the new FFRDC's ability to be established quickly and relatively less costly, and to attract top quality people. A new division in an existing FFRDC was given high marks for its perceived ability to be established quickly and relatively less costly by drawing upon existing talent and infrastructure. However, several consultants expressed concerns about using an existing FFRDC: (1) the current sponsors would probably not allow their FFRDCs to assume the SDI Institute's mission, (2) the assumption of the SDI mission could severely impair the FFRDCs' current operations, and (3) present work commitments would impair the existing FFRDCs' responsiveness to SDIO. A new division in an existing FFRDC was rated first by one consultant and second by 5 consultants.

The consultants ranked expansion of SDIO and creation of a new DOD/service group seventh and eighth, respectively, for overall effectiveness. The consultants' consensus was that SDIO and a new DOD organization would not be able to attract high-quality scientific and engineering talent because of low salaries and other Civil Service restrictions and would not be able to be established and grow rapidly.

The consultants found it difficult to compare organizations on the basis of cost and selected no clear favorite as the least-cost organization. Most selected the for-profit firm as the highest cost option and scored the existing FFRDC, the expansion of SDIO's staff, a new division in a FFRDC, and a new DOD/service group as the first through fourth lowest cost options. Cost was not a primary criterion for DOD's ranking of organizational options. (See app. II.)

Impact of DOD's Plans on the Institute's Independence and Objectivity

The Secretary of Defense stated DOD's position on establishing the Institute in an August 1986 report to the Senate Committee on Armed Services. The consultants and heads of nine DOD-sponsored FFRDCs expressed the following views on DOD's plans for the Institute. A more detailed discussion is included in appendix III.

Contractor Selection

Using the Secretary of Defense's sole-source selection authority under the Competition in Contracting Act of 1984, 10 U.S.C. 2304, DOD invited a group of individuals to submit a proposal for the establishment and operation of the Institute, rather than opting to engage in a competitive negotiation process. Any others wishing to submit proposals would be allowed to do so. Eight of the nine original contracts for the DOD-sponsored FFRDCs included in our review had been established by sole-source awards.

We asked the consultants to indicate which method—sole source or competitive selection—they believed would least compromise the independence and objectivity of the contractor chosen to provide technical support to SDIO. No consensus appeared among consultants on this question. Three said that competition compromises independence and objectivity more than sole-source selection; four said that competition compromises less than sole-source selection; and three said that the impact of the selection methods on independence and objectivity is about the same.

On April 4, 1986, a firm called the SDI Institute was incorporated in Washington, D.C. Section 213 (a) of the National Defense Authorization Act for Fiscal Year 1987 provides that the Secretary of Defense may not obligate or expend funds for the new FFRDC unless funds are specifically authorized to be appropriated for such purpose, other than in an appropriation act or continuing resolution.

Reviewing Proposals

DOD stated that SDIO, alone, would review any proposal received from prospective contractors interested in operating the SDI Institute. Nine of the 11 consultants said that some kind of peer review of the proposal(s) is necessary to best guarantee the independence and objectivity of the

Institute. The consultants reached no consensus on what organizations should comprise the review group, but believed that peer review would enhance the credibility of the review process, improve the quality of the proposal(s), and was necessary in the political climate of the SDI. Two consultants indicated that a review by SDIO alone was sufficient.

Staff Selection

DOD, in its August 1986 report, stated that the Institute's president and the heads of its technical directorates would have to be acceptable to the SDIO's Director. We were informed by the Secretary of Defense's Special Assistant on the Institute that the Director of SDIO would exercise veto power over the selections. Subsequent to our work, however, DOD clarified its position stating that the Director of SDIO would require concurrence in the selection of the Institute's president and coordination with the appropriate SDIO peer directors in the selection of key Institute technical personnel, but would exercise veto power only over the selection of the Institute's president.

We asked the consultants and heads of the nine FFRDCs for their views on whether SDIO's veto power over staff selections would compromise the independence and objectivity of the FFRDC. The consultants were about evenly split, with five saying that it probably would not and six saying that it would or probably would. Three considered a staff selection veto power over the FFRDC director acceptable; two would accept it to the technical director level; three said no staff selection veto power at any level would be acceptable; and one favored veto power down to an unspecified level. The other two consultants did not express strong views on the acceptability of a veto power.

All nine heads of FFRDCs said that staff selection veto power would compromise a FFRDC's independence and objectivity. Two officials considered sponsor veto power over a FFRDC's director acceptable, but none would advocate veto power over technical directors. Only one of the sponsors of the nine FFRDCs exercises veto power over staff selection: the Navy, sponsor for the Center for Naval Analyses, exercises veto power over the selection of the president and vice-president.

Work Plans

DOD proposed that SDIO would review the Institute's work plan every 6 months. We asked the FFRDCs' heads whether the necessity for a sponsor's approval of a work plan would compromise the FFRDC's independence and objectivity more than joint agreement on the plan. Two believed there is no difference between work plan approval and joint agreement, while three thought that work plan approval compromises independence and objectivity more than joint agreement. All nine FFRDC directors agreed that work plans must be developed by mutual agreement and consultation between the sponsor and the FFRDC.

Five FFRDCs negotiate work with their sponsors; three have annual work plans approved by advisory committees after sponsor/center interaction; and one has 1- and 5-year plans approved by its sponsor.

Provisions for Independent or Self-Initiated Work

The Secretary of Defense initially expressed his opposition to committing a fixed percentage of the Institute's budget to perform independent research or self-initiated work. However, he said that DOD is not opposed to contract provisions that would permit the Institute the flexibility to initiate its own work proposals, and DOD would explore negotiating such provisions toward that purpose. Subsequently, DOD noted that SDIO would encourage the Institute to initiate related research that the Institute deems necessary and that SDIO would provide a level of funding for the Institute's independent research to be determined in future contract negotiations.

Officials of the nine FFRDCs included in our review stated that the guarantee of some level of independent research generally enhances the FFRDC's independence and objectivity. Independent research permits the FFRDCs to do forward planning, to explore long-term problems, and to examine questions that the sponsors do not think or want to ask. All nine FFRDCs have provisions for independent or self-initiated research.

Conflict-Of-Interest and Post-Employment Restrictions

DOD plans to address real or apparent conflicts of interest through SDIO's sponsoring agreement with the SDI Institute. For example, the sponsoring agreement would prohibit any SDI Institute employee, officer, or Board of Trustee member from holding any position with SDIO. The agreement would also prohibit more than one-half of the members of the SDI Institute Board of Trustees from simultaneously holding any position with the SDI Advisory Committee or any similar body which provides technical, scientific, or strategic advice to DOD on SDI. Moreover, in order to avoid any actual or apparent conflict-of-interest, DOD expects that persons who are members of both the SDI Advisory Committee and the SDI Institute Board of Trustees would abstain from participation in any evaluation or advice by the SDI Advisory Committee regarding the SDI Institute. Section 208 (a) of title 18, United States Code, would bar SDI Advisory Committee members who are also on the SDI Institute Board of

Trustees from participating in recommendations directly affecting the new FFRDC's financial interests, in the absence of a waiver under section 208 (b).

DOD intends to minimize the possibility of specific conflicts of interest between the Institute and other organizations through specific restrictions on the Institute's outside work and on Institute employees' positions with other organizations that have financial interest in SDI work and through requirements placed on Institute employees to safeguard information owned by other contractors. DOD intends no post-employment restrictions on Institute employees.

The nine FFRDC directors did not believe that the absence of post-employment restrictions would compromise the independence and objectivity of the FFRDC. All nine FFRDCs have conflict-of-interest provisions, but none have post-employment restrictions.

FFRDCs Established to Support Major Research Programs

Some consultants and FFRDC officials told us that DOD's proposal to establish a new FFRDC for the SDI program is not unusual and that FFRDCs have been established to support programs, missions, or functions. For example, they noted the establishment of The Aerospace Corporation to support the military space and advanced ballistic missile programs, the Massachusetts Institute of Technology's Lincoln Laboratory to support the U.S. air defense mission, and the Logistics Management Institute to advise DOD on logistics management.

Agency Comments

In commenting on a draft of this report, DOD expressed the view that the consultants performed a credible assessment of the organizational options and that the consensus views of the consultants are reasonable. However, in relation to the issue of peer review of proposal(s) to operate the SDI Institute, DOD continues to believe that SDIO has the appropriate resources and personnel to best evaluate the proposal(s). DOD's position is that if additional outside review were needed, then it would be considered. We believe that the consultants' views in favor of peer review of the proposal(s) have merit and deserve DOD's consideration.

DOD provided several technical comments that have been incorporated into the report, as appropriate.

We are sending copies of this report to the Director, Office of Management and Budget; the Secretary of Defense; and the Director, Strategic Defense Initiative Organization.

Charles A. Bowsher

Charles A. Bowsher
Comptroller General
of the United States

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Abbreviations

DOD	Department of Defense
FFRDC	federally funded research and development center
GAO	General Accounting Office
SDI	Strategic Defense Initiative
SDIO	Strategic Defense Initiative Organization

Appendix I

FFRDCs and the SDI Institute

The Office of Federal Procurement Policy's Policy Letter 84-1 provides government-wide policies for establishing FFRDCs. FFRDCs are research and development organizations that provide technical advice to their government sponsor(s). FFRDCs must receive at least 70 percent of their financial support from the government and, although multiple agency sponsorship of a FFRDC is possible, for administrative purposes one agency must be designated as the primary sponsor.

Under the government guidance, FFRDCs should not perform research or development that might be better performed by industry, universities, or government agencies. Moreover, FFRDCs are not permitted to compete with industry for government contracts. Neither can they perform work for the private sector. Since FFRDCs do not manufacture or sell hardware or perform any work for industry, they are to remain impartial and free from external influence in evaluating issues for their government sponsor(s). FFRDCs are to maintain special relationships with their government sponsor(s) and serve as "honest brokers" by maintaining their objectivity and independence, free from conflicts of interest found in some types of organizations. Finally, FFRDCs have provisions for conducting independent research.

Currently, 36 FFRDCs operate under the principal sponsorship of the Departments of Defense, Energy, and Health and Human Services, the National Aeronautics and Space Administration, and the National Science Foundation. Most DOD FFRDCs were established between 1942 and 1963 to augment DOD in-house research and development capabilities. During this period, DOD established 39 FFRDCs to conduct research and development in areas in which the government did not yet have expertise. As a result of congressional concern, expansion of DOD's in-house capabilities, and the fact that many FFRDCs were no longer responding to DOD's changing needs, DOD had reduced the number of its FFRDCs to six by 1976. Today, DOD sponsors 10 FFRDCs with a total fiscal year 1985 funding level of over $757 million.

Criteria for Establishing a New FFRDC

According to Policy Letter 84-1, agencies should only establish a FFRDC "to meet some special research or development need which, at the time, cannot be met as effectively by existing in-house or contractor resources." FFRDCs do not have a prescribed organizational structure. Some are contractor-owned/contractor-operated or government-owned/contractor-operated, while others exhibit various degrees of contractor/government control and ownership. According to Policy Letter 84-1, a new FFRDC should:

- perform, analyze, integrate, support and/or manage research and development either upon direct request by the government or under a broad charter from the government, but in either case the results are directly monitored by the government;
- receive 70 percent or more of its funds from the government, with one government agency usually predominating in that support;
- operate as a separate unit within a parent organization or as an independent organization; and
- establish a long-term relationship (usually 5 years) with its sponsoring organization.

Categories of FFRDCs

Generally, FFRDCs are grouped into four categories based on the type of work they perform. The categories are research laboratories, research and development laboratories or "national laboratories," study and analysis centers, and systems engineering/systems integration centers.

Most FFRDCs are administered by a contractor, such as a university or consortium of universities, a non-profit organization or institute, or an industrial firm. Some are independent or self-contained within their own management organizations and are not administered by separate contractors. These FFRDCs report directly to their sponsor(s).

Since 1983, DOD has established four new FFRDCs: The Software Engineering Institute at Carnegie Mellon University in Pittsburgh, Pennsylvania; the Logistics Management Institute in Bethesda, Maryland; and the Rand Corporation's Arroyo Center and the National Defense Research Institute,[1] both in Santa Monica, California.

Currently, DOD sponsors one research and development laboratory, six study and analysis centers, and three systems engineering/systems integration centers. Table I.1 shows DOD's 10 FFRDCs by category. It also shows the principal sponsor, contractor, date established, fiscal year 1985 funding level, and the provisions for work plan approval and independent research.

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[1] In 1986, The Rand Corporation's FFRDC, called Rand-OSD/OJCS, which had been established in 1983 for the Office of the Secretary of Defense/Organization of the Joint Chiefs of Staff, changed its name to the National Defense Research Institute.

Table I.1: Information on DOD-Sponsored FFRDCs

Dollars in millions

FFRDC by category	Principal sponsor	Contractor	Date established	Funding level[a]	Work plan approval	Independent research
Study and Analysis Centers						
Center for Naval Analyses	Navy and Marine Corps	Hudson Institute	1942	$25.4	Plan negotiated with sponsor	Maximum 15 percent established by contract
Institute for Defense Analyses	Ofc. Sec. of Defense, Joint Chiefs of Staff, and Defense agencies	Institute for Defense Analyses	1956	26.0	Plan negotiated with sponsor	1.5 percent of budget based on Defense Acquisition Regulations
Logistics Management Institute	Asst. Sec. of Defense/ Manpower, Installations, Acquisitions/Logistics, and Defense agencies	Logistics Management Institute	1961	11.8	Plan negotiated with sponsor	Agreement from sponsor for about 5 percent, but not to exceed 10 percent
Rand-Arroyo Center	Army	The Rand Corporation	1984	5.0[b]	Annual plan approved by advisory committee after sponsor/ contractor interaction	Up to 25 percent permitted by Army regulation
Rand-National Defense Research Institute	Office of Secretary of Defense/Organization of Joint Chiefs of Staff	The Rand Corporation	1983	0.6	Annual plan approved by advisory committee after sponsor/ contractor interaction	Permitted by OSD/ OJCS regulation and has totalled annually about 10-12 percent
Rand-Project Air Force	Air Force	The Rand Corporation	1946	18.3	Annual plan approved by advisory committee after sponsor/ contractor interaction	Permitted by Air Force regulation and has totalled annually about 10-12 percent
Systems Engineering/ Systems Integration						
The Aerospace Corporation	Air Force Space Division	The Aerospace Corporation	1960	248.2	Plan negotiated with sponsor	Contractual fixed fee can be used for research
The MITRE Corporation/ C3I Division	Air Force	The MITRE Corporation	1958	220.6	Plan negotiated with sponsor	2.5 percent in budget and 3 percent for Mission- Oriented Investigations & Experiments
Software Engineering Institute	Air Force	Carnegie Mellon University	1984	6.1	One-and five-year work plans approved by sponsor	10 percent in negotiated contract
Research and Development Laboratory						
Lincoln Laboratory	Air Force	M.I.T.	1951	$195.2	Annual plan approved by advisory committee after discussion with sponsor	No, treated with contractor separately from contract

[a] According to the National Science Foundation, these funding levels represent fiscal year 1985 federal obligations to FFRDCs for only research and development and research and development plant.

[b] The Rand Corporation's Arroyo Center funding for fiscal year 1985 consisted of only operations and maintenance funds.

DOD's research and development laboratory focuses on advanced development research. The six study and analysis centers were established to assist the Office of the Secretary of Defense and the military services in solving organizational and operational problems. No hardware-related laboratory research and development are conducted in these centers. The three systems engineering/systems integration centers provide systems engineering, research and development systems integration, and management support for development of large technical systems. DOD established them because it did not have the in-house capability to manage the development, integration, and verification of large systems. Moreover, DOD's position was that this capability was not readily available in the private sector without conflict-of-interest problems.

Reasons for Establishing FFRDCs

FFRDCs can be established to support a program, mission, or function. For example, The Aerospace Corporation was established in 1960 to support military space and advanced ballistic missile programs. The Massachusetts Institute of Technology's Lincoln Laboratory was formed in 1951 to support the U.S. air defense mission. The Logistics Management Institute was established in 1961 and designated a FFRDC in 1984 to advise DOD on logistics management.

With the exception of some of the newer FFRDCs, according to one FFRDC official, most FFRDCs were established to keep intact a unique and valuable resource: a nucleus or core of experts to meet some special research or development need that the government could not meet by existing in-house or private sector resources. Rarely has a decision been made to establish a new FFRDC and then staff it with the best-qualified people available. Rather, FFRDCs have generally been established around existing, highly capable groups of experts which, in turn, have been able to attract other highly qualified persons.

SDI Institute

According to DOD, the new FFRDC, to be known as the SDI Institute, would function primarily as a systems engineering/systems integration FFRDC for the SDIO. The Institute's mission would be to conduct studies and analyses of emerging SDI technologies and system concepts. The Institute's functions would include, but would not be limited to,

- identifying and evaluating existing and potential technological advances and system concepts;
- reducing the costs and increasing the effectiveness of both basic and applied research;

- advising SDIO on the utility and implications of integrating each aspect of the SDI program;
- assessing and developing evolving technical requirements, architectures, and test bed requirements;
- performing test and evaluation planning;
- integrating offense/defense scenarios and analyses into useful conclusions;
- framing issues for decisions by SDIO;
- developing and maintaining a data base on active SDI projects and capabilities, and continually analyzing these for overlap, duplication, and opportunities for coordination; and
- coordinating technical tasks and serving as a liaison with the military services, industry, universities, and government laboratories.

According to the Secretary of Defense's Special Assistant on the Institute, the Institute's staffing level would be expected to start at about 50 professionals, grow to about 150 to 200 professionals, and have a maximum of about 300 professionals.

The Director of SDIO has indicated that the Institute's budget would be expected to constitute less than one percent of SDIO's total budget. For fiscal year 1986, one percent of SDIO's budget would have been $28 million. The Director has also indicated that the Institute would not be a separate line item in SDIO's budget, but would be funded by taxing each SDIO program element according to its projected use of the Institute.

DOD would require that the Institute be located in the Washington, D.C., metropolitan area. Other than some computer capability, the Institute would not have its own research facilities. Rather, the Institute would have access to research results from other organizations working on the SDI program, including the proposed National Test Bed.[2]

According to DOD, it is possible that the SDI Institute may subcontract in appropriate circumstances. However, DOD believes that the Institute will be successful over time in attracting the necessary personnel to avoid any great frequency of subcontracts. Further, there should be no Institute-issued research subcontracts at all, since the Institute will not be undertaking primary research on major experiments itself, with the possible exception of updating and refining the overall system architecture.

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[2] The National Test Bed will be a network of facilities used to simulate battle management and command, control, and communication concepts and to evaluate system architectures and their component technologies.

In commenting on the internal SDI Institute organizational structure, the Secretary of Defense stated that the Institute would be able to structure itself any way it wants.

Comparative Effectiveness and Costs of Organizational Approaches

According to Policy Letter 84-1, any government agency that considers establishing a new FFRDC should first consider existing alternatives for satisfying its requirements and then indicate its intention in The Federal Register and Commerce Business Daily. According to DOD, it evaluated alternative sources in accordance with the policy letter and determined that a new FFRDC could best satisfy SDIO's needs for technical support. From March to June 1986, DOD published notices of intent in The Federal Register and Commerce Business Daily to establish a new FFRDC to be called the SDI Institute.

We asked 11 consultants (see app. IV) to review the organizational options for satisfying SDIO's needs and express their views on the relative effectiveness and cost of each. We recorded those views on a data collection instrument (see app. V) and met individually with each consultant to further explore the bases for his/her views. The consultants ranked the creation of a new FFRDC and a new division in a FFRDC equally as the most effective options for meeting SDIO's needs. They found it difficult to compare the organizations on the basis of cost, and there was no clearly preferred approach in the least-cost category.

DOD's Assessment of Alternatives

In November 1985, an ad hoc SDIO Technical Support Working Group was established in response to a request from the Director, SDIO, to examine and assess possible institutional forms for providing SDIO with technical support. The working group consisted of personnel from SDIO and the SDI Advisory Committee, a not-for-profit consultative group of private citizens who make available their scientific and technical expertise to the SDI program. Because of the wide scope and complex nature of the SDIO task, the working group determined it essential that SDIO quickly augment its capability to analyze and direct its research and technology programs. The working group, with input from other elements within DOD and from outside consultants, identified the following criteria for this SDIO support capability.

- It should be able to attract and retain top technical and internal management talent. This will require a combination of challenging assignments, important responsibilities, competitive salaries, and a prestigious organization having clearly perceived professional opportunities.
- It should be able to be established quickly and grow rapidly, both in terms of the number of personnel and in functional capabilities as needs unfold.

- It should be able to be flexible in terms of its ability to respond quickly to changes in priorities, budgets, evolving technologies, or other developments. Responsiveness obviously will be enhanced by close proximity and dedication to SDIO itself.
- It should be able to provide independent and objective advice based on a knowledgeable evaluation of all existing information, including sensitive government and industrial data. It must operate fully in the public interest with full disclosure of its affairs to the government as may be legally required. It must not engage in any production or other service activity related to the SDI program and must not compete for any other SDIO procurement. It must be free from any apparent or actual conflicts of interest that could influence the objectivity of its work or appear to give or potentially offer its other clients, if any, an unfair competitive advantage with regard to SDI work through access to inside information.
- It should be able to possess the technical and functional capabilities needed to perform, analyze, integrate, and support the basic and applied research of SDIO. It must be capable of performing technical program planning and of providing general systems engineering oversight on very large systems.
- It should be able to dedicate itself to this technical support role for SDIO, and abstain from all other SDI-related work, in order to provide total objectivity and responsiveness to SDIO needs and to avoid any actual or apparent conflicts of interest with its defined role.

The working group evaluated possible alternatives to meet the long-term needs of SDIO and concluded that the best option was to establish a new FFRDC. In arriving at its decision, the group considered three basic categories of organizational forms that might meet the technical support needs of SDIO:

- government organizations, including expansion of the present SDIO staff or establishment of a new DOD field agency or a military organization;
- for-profit firms, including large industrial firms, small-to-mid-sized systems engineering and technical assistance contractors, or a new consortium of such firms or contractors, either U.S. or foreign; and
- non-profit firms, including existing FFRDCs, a new division within an existing FFRDC, a new FFRDC, universities, and private not-for-profit laboratories/corporations, new or existing.

The working group's assessment of each category was as follows:

- The use of a government organization to provide the special technical support needs of SDIO was found to be undesirable for two main reasons:

it would be difficult to attract, retain, and manage the required number of highly qualified scientific and engineering personnel; and the needed personnel buildup could not occur sufficiently rapidly, or respond quickly enough to changing requirements.

- The use of for-profit firms was found to be undesirable because of the conflicts of interest inherent in the for-profit organizational approach, the probable inability to ensure total objectivity and independence of thought, and the negative business impact on such a firm through its necessary dedication to SDIO technical support alone.
- Of the various not-for-profit alternatives examined, a new FFRDC ranked highest. The FFRDC mechanism was considered to offer quick, responsible handling of SDIO needs, while allowing considerable freedom in establishing salary structures and a working environment conducive to attracting top scientific and engineering talent. While reliance on an existing FFRDC or other non-profit organization potentially would provide more readily or more quickly available capability and staff, none was found to have the breadth of specialized expertise to undertake major SDI technology program review and oversight. Any existing organization, including a FFRDC or national laboratory, necessarily will have ongoing work and a deeper background in one technology or another. Neither would any organization already in existence be in a position to offer the desired degree of dedication to and exclusive focus on the SDI program. It was found that the establishment of a new FFRDC, specifically oriented to SDIO technical support needs, likely would result in materially greater responsiveness and support than would the reorientation of an existing FFRDC.

Consultants' Views

We asked 11 consultants with broad experience in and out of government to evaluate the same organizational options evaluated by the working group. We asked them to rank the options based on their overall judgments about the organizations' relative effectiveness in providing technical support to SDIO. We further asked the consultants to rank the options based on their relative costs, considering both start-up and yearly operating costs. The individual rankings were combined to create a single overall value for each organizational approach, based on the total number of points assigned.

Effectiveness of Organizational Options

We asked the consultants to apply the criteria identified by the working group, an additional criterion,[1] and any additional major criteria that they wished to consider. We had the consultants rate each organizational option on each criterion based on their judgment of whether the organization would strengthen or limit the achievement of the criterion. We used a scale of +2 (greatly strengthen), +1 (strengthen), 0 (strengths/limitations balance out), -1 (limit) and -2 (greatly limit). Table II.1 presents the net scores for the organizational options for each criterion.

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[1] Provide an adequate competitive environment, which encourages technical quality and cost containment.

Table II.1: Net Scores of Organizational Options for Each Criterion

	Organizational approaches							
Criteria to be satisfied	SDIO	New DOD/ service group	For-profit firm	University	Existing FFRDC/ national lab.	New division in existing FFRDC/ national lab.	New FFRDC/ national lab.	Other non-profit group[a]
Criterion #1 Attract and retain top technical and internal management talent. Consider relative prestige and appeal in offering professional opportunities, including competitive salaries and benefits	−11	−14	+12	0	+11	+16	+10	+4
Criterion #2 Be able to be established quickly and grow rapidly, both in terms of number of personnel and in functional capabilities as needs unfold. Consider relative freedom from institutional constraints in justifying, negotiating, and executing personnel staff requirements	−10	−17	+13	−3	+11	+15.5	+9	+2
Criterion #3 Capability to respond sufficiently quickly to changing requirements such as priorities, budgets, and evolving technologies. Consider also proximity and dedication of resources to SDIO requirements	+1	−3	+9	−3	+8	+11.5	+14	+6
Criterion #4 Provide independent and objective advice based on a knowledgeable evaluation of all existing information, including sensitive government and industrial data. Consider relative freedom from other institutional loyalties (service/corporate affiliations), relative freedom from real or apparent conflicts of interest in handling industry proprietary data and ability to safeguard national security information, full disclosure of affairs as may be legally required, intellectual independence in recommending controversial actions and strategies to SDIO	−5	−3	−4	+11	+9	+13.5	+12	+8
Criterion #5 Possess technical and functional capabilities needed to perform, analyze, integrate, and support the basic and applied research of the SDIO. Must maintain close, continuous interactions with SDIO in performing technical program planning and in providing general systems engineering oversight on very large systems	+5	+6	+8	+2	+9.5	+15	+14	+6
Criterion #6 Dedicate itself to this technical support role for the SDIO in order to avoid any actual or apparent conflicts of interest with its defined role	+16	+8	−5	+7	+7.5	+10	+20	+7
Criterion #7 Provide an adequate competitive environment which encourages technical quality and cost containment	−6	−9	+9	+1	+10.5	+13	+11	+6

	Organizational approaches							
Criteria to be satisfied	SDIO	New DOD/ service group	For-profit firm	University	Existing FFRDC/ national lab.	New division in existing FFRDC/ national lab.	New FFRDC/ national lab.	Other non-profit group[a]
Criterion #8 Other criteria mentioned								
Provide a professional climate and management flexibility to meet unique organizational requirements	−1	−1	+1	+1	+1	+2	+2	+1
Provide objective peer evaluation of quality and activity	−4	−4	−3	+3	+1	+1	+1	N/A
Provide the ability to "get around" government acquisition requirements	N/A	N/A	−2	+2	+2	+2	+2	+2
Provide the ability to most effectively react to technical competition	N/A	N/A	+2	0	0	0	0	0

[a] Three consultants did not rank this approach for any criteria.

We then asked the consultants to rank the organizational options from 1 to 8 on their relative effectiveness in providing technical support to SDIO. "One" was to be considered the most effective and "eight" the least effective option. Table II.2 (1) presents an overall ranking of organizational options on effectiveness, based on the consultants' individual rankings, (2) shows the number of consultants who ranked the options as either their first/second or seventh/eighth choices, and (3) provides the SDIO working group's ranking of options.

Table II.2: Ranking According to Comparative Effectiveness of Organizational Options

Ranking[a]	Organization	Total of individual rankings	Number of consultants who ranked organization[b] 1 or 2	7 or 8	Ranking by DOD
1	New FFRDC/national laboratory	26	7	0	1
1	New division in existing FFRDC/national laboratory	26	7	0	2
3	Existing FFRDC/national laboratory	36	3	0	3
4	Other non-profit group	37[c]	3	0	5
5	For-profit firm	52	2	3	6
6	University	62	0	3	4
7	SDIO	71	0	7	7
8	New DOD/service group	74	0	7	8

[a] 1 is most effective; 8 is least effective.

[b] Two consultants gave the same rank to several organizations.

[c] One consultant chose not to rank this organizational option because the consultant could not envision an organization that fit this category. If the consultant had assigned a score, this organization's minimum score would have been 38, and its maximum score would have been 45.

FFRDC/National Laboratory Option

The consultants preferred two of the FFRDC/national laboratory approaches (new FFRDC/national laboratory and new division in existing FFRDC/national laboratory) both in terms of achieving overall effectiveness and in satisfying individual criteria.

These organizational approaches tied for first in overall effectiveness. Within these options, the FFRDC was the preferred choice over the national laboratory because the laboratories have traditionally been involved in research and development, and the new Institute's mission would be to perform research, studies, and analyses—a mission more like that performed by existing DOD FFRDCs.

The consultants generally ranked the FFRDCs favorably because of their proven records at (1) attracting high-quality personnel, (2) providing objective and independent assistance, and (3) safeguarding proprietary data. One consultant also noted that FFRDCs have shown that they can hire personnel who can work with high levels of security data. Conversely, about half of the consultants indicated that the FFRDCs and national laboratories have demonstrated the negative characteristic of perpetuating themselves by going beyond their original missions to focus on their own agendas.

A new FFRDC was rated first in effectiveness by six consultants and second by another consultant. The new FFRDC option scored especially well with the consultants on the issues of providing independent, objective, and dedicated assistance. One consultant's view was that a new FFRDC will have only one master; hence, it will be independent from other organizational biases.

The consultant who rated the new FFRDC option second in effectiveness said that it would have been ranked first if it were not for uncertainties about its ability to get established quickly. Others expressed the same concern about the new FFRDC's ability to attract quality staff quickly. One consultant said that it will be difficult to get people to join the new FFRDC because of the uncertainty of its existence and the problem in recruiting high-quality people for an organization with no track record. Excellent people are simply not willing to move. According to this consultant, "If the first 10 to 20 individuals to join the new FFRDC are the right people, the FFRDC will have little difficulty attracting the remainder." Another consultant, however, said that the new FFRDC scored well on its ability to attract quality staff because it is easier to get people enthusiastic about doing something new.

Two consultants expressed the view that a new FFRDC would be too costly an undertaking for a program with an uncertain future. The same two individuals believed that a new FFRDC specifically created to support SDIO would tie the organization too closely to SDIO and, thus, give the appearance that it lacks independence and objectivity.

A new division in an existing FFRDC was rated first by one consultant and second by five consultants. A key factor in its ranking was its ability to draw upon existing talent and infrastructure to get underway quickly. However, about half of the consultants raised concerns, including (1) current sponsors would probably not allow their FFRDCs to assume the Institute's mission, (2) the assumption of that mission could severely impair the FFRDCs' operations and (3) present work commitments would impair the FFRDCs' responsiveness to SDIO.

Other Non-Profit Group

About half of the consultants had difficulty envisioning the type of organization that would fit into this category. For example, two who rated this option as their second choice for effectiveness could not identify an existing organization that they would strongly endorse.

For-Profit Firm

For-profit firms were rated first for effectiveness by two of our consultants. One indicated that a private company could best perform the tasks of systems integration and program management. The other indicated that a for-profit firm is under the right kind of competitive arrangement and is best because of its ability to hire and fire people easily. Moreover, it is more qualified than any other type of entity. For-profit firms scored especially high on their ability to attract and retain top talent (criterion 1) and to be established quickly and grow rapidly (criterion 2). They scored very low on criterion 6, which includes the avoidance of conflict of interest and on criterion 4, which includes the handling of industry proprietary data.

The consultants focused on one primary reason why for-profit firms did not fare well: for-profit firms would be reluctant to exclude themselves from hardware contracts where most of the SDI funding is directed and, without such exclusion, would have conflict-of-interest problems. One consultant added that other firms would be reluctant to share proprietary data with the for-profit firm.

University

Universities were not rated first or second by any of our consultants. They received one seventh and two eighth place votes and generally were rated low on most criteria. Their highest score was received on criterion 4, which includes independent and objective advice, freedom from conflicts of interest in handling industry proprietary data, and intellectual independence. The consensus among the consultants was that most universities would not agree to operate an organization as politically controversial as the SDI Institute. Other limiting factors mentioned included low salaries, slow responsiveness, and inexperience in recruiting.

SDIO and New DOD/Service Group

SDIO and a new DOD/service group ranked seventh and eighth, respectively. They scored low on most criteria. Their lowest scores came on their ability to attract and retain top talent (criterion 1) and to be established quickly and grow rapidly (criterion 2). Their best scores came on their dedication to SDIO's technical support (criterion 6). SDIO scored especially well on criterion 6.

The consensus among the consultants was that neither SDIO nor a DOD organization would be able to attract quality scientific and engineering talent because of low salaries and other Civil Service restrictions. SDIO was rated poorly on independence by several consultants because of its close ties to the SDI program. One consultant said that SDIO would have a tendency to tell the boss what he wants to hear.

Cost of Organizational Options

We asked the consultants to rank the organizational options from 1 to 8 on their relative cost in providing technical support to SDIO. "One" was to be considered the least costly, and "eight" the most costly option. Table II.3 (1) presents an overall ranking of organizational options on cost based on the consultants' individual rankings, and (2) shows the number of consultants who ranked the options as either their first/second or seventh/eighth choices.

Our consultants found it difficult to rank the organizations on the basis of comparative cost. One individual considered all organizations the same. Another individual indicated a preference for rating the organizations on efficiency. A third individual said that there is no way to directly compare and rank industry and government costs on the same scale.

Unlike our effectiveness ranking, there was no clearly preferred organizational approach in the least-cost category, as indicated by the large number of organizations that received first or second place rankings. The for-profit firm was clearly considered highest in cost, although it was ranked as the least costly option by one consultant.

Table II.3: Ranking According to Comparative Costs of Organizational Options

			Number of consultants who ranked organization[b]	
Ranking[a]	Organization	Total of individual rankings	1 or 2	7 or 8
1	Existing FFRDC/national laboratory	29	4	0
2	SDIO	33	4	2
3	New division in existing FFRDC/national laboratory	37	3	0
4	New DOD/service group	38	4	1
5	University	41	2	1
6	New FFRDC/national laboratory	50	1	3
7	Other non-profit group	51[c]	0	3
8	For-profit firm	67	1	7

[a] 1 is least costly; 8 is most costly.

[b] Some consultants did not rank the organizations while others gave the same rank to more than one organization.

[c] One consultant chose not to rank this organizational option because the consultant could not envision an organization that fit this category. If the consultant had assigned a score, this organization's minimum score would have been 52, and its maximum score would have been 59.

An existing FFRDC/national laboratory and a new division in an existing FFRDC/national laboratory scored well on the cost ranking. Lower startup costs were mentioned by some consultants because of the existing infrastructure and the ability to use existing facilities and equipment. Since a new FFRDC/national laboratory would not have such advantages, that option was ranked much lower.

Some consultants said that SDIO and the DOD/service group scored well because of low salaries. One consultant indicated that SDIO was rated first in cost containment for the same reasons that it rated poorly in effectiveness: it offered lower salaries, no large new management structure, and no new facilities.

Several reasons were given for the for-profit firms' poor rating on cost, including (1) their tendency to do whatever is necessary to get the job done, such as hiring the best people and obtaining the best equipment, and (2) their higher salaries, overhead, and fees.

Impact of DOD's Plans on Independence and Objectivity

According to the Secretary of Defense, DOD intends the SDI Institute to function in an independent and objective manner. Although there would be a close liaison between SDIO and the Institute, the Secretary indicated that there is no reason to believe that such a working relationship would lead reputable scientists to compromise their objectivity or independence.

DOD's plans for the Institute have been outlined in a number of documents, principally in the SDIO Director's comments on a May 30, 1986, Congressional Research Service report[1], in an August 1986 report by the Secretary of Defense to the Senate Committee on Armed Services, and in discussions with us. SDIO's plans for the Institute raised concerns within the Congress as to whether the proposed FFRDC would be independent and objective in accordance with the provisions of Policy Letter 84-1. The areas of concern involved

- contractor selection,
- review of proposal(s),
- staff selection,
- work plan approval,
- provisions for independent or self-initiated work, and
- conflict-of-interest and post-employment restrictions.

Eleven consultants and the directors of nine DOD-sponsored FFRDCs with whom we met (see app. IV) provided their opinions on the impact of DOD's plans on the Institute's independence and objectivity. Although viewpoints varied with the experience and backgrounds of the respondents, some patterns emerged in the answers to our data collection instrument and explanations of the responses. In addition, individual responses sometimes presented insights into the FFRDC/sponsor relationship.

Office of Federal Procurement Policy Guidelines

Policy Letter 84-1 outlines several policies relating to maintaining the independence and objectivity of FFRDCs:

- Government monitoring is not to create a personal services relationship or to cause disruptions that are detrimental to the productivity and/or quality of the FFRDC's work.

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[1] The Strategic Defense Initiative Institute: An Assessment of DOD's Current Proposal, Congressional Research Service, Library of Congress, May 30, 1986, updated August 11, 1986.

- The activity is to be operated as an autonomous organization or as an identifiable, separate operating unit of a parent organization.
- The activity is to be required to conduct its business in a responsible manner befitting its special relationship with the government, to operate in the public interest free from organizational conflict-of-interest, and to disclose its affairs as a FFRDC to the primary sponsor.
- The sponsoring agency, in establishing a FFRDC, shall ensure that the purpose, mission, and general scope of effort of the FFRDC are stated clearly enough to enable differentiation between work that should be performed by the FFRDC and work that should be performed by a non-FFRDC.
- The government-FFRDC relationship should be of a type to encourage the FFRDC to maintain currency in its field(s) of expertise, maintain its objectivity and independence, preserve its familiarity with the needs of its sponsor(s), and provide a quick response capability.

DOD's Plans for Establishing the SDI Institute

The SDI Institute, according to DOD, is being established to meet the technical support needs of SDIO in objectively evaluating and integrating SDI research. SDIO proposes to establish the Institute and to set policies concerning its operations and relationship with its sponsor agency. The Secretary of Defense stated DOD's position on establishing the Institute in an August 1986 report to the Senate Committee on Armed Services.

Contractor Selection

As stated in the August 1986 report, the Secretary of Defense, pursuant to his authority under the Competition in Contracting Act of 1984 (10 U.S.C. 2304 (c)(3)(B)), determined that the immediate technical support needs of SDIO would not be met by a full, formal procurement, which in the case of the most recently established DOD-sponsored FFRDC—the Software Engineering Institute—took about ten months. Accordingly, the Secretary invited a number of prominent scientific and technical individuals to submit a proposal to operate the Institute. The Secretary, noting that many of these persons are also members of the SDI Advisory Committee, a not-for-profit consultative group of private citizens who make available their scientific and technical expertise to the SDI program, determined them to be probably the most qualified people to set up the Institute.

The Secretary noted that no commitment had been or would be made until the invited proposal was received, reviewed, and evaluated. He also indicated that companies that had contacted DOD in response to the announcements of DOD's intent to establish the Institute were advised that DOD would consider fully and fairly any proposals that were received.

Review of Proposal(s)

SDIO plans to be the sole body to review proposals to operate the new FFRDC. SDIO currently has no plans to enlist peer review by persons outside the government in this review process. According to the Secretary of Defense, SDIO has the appropriate resources and personnel to best evaluate proposals to operate the Institute. The SDIO Deputy Director for Programs and Systems will chair an evaluation board consisting of SDIO Technology Office Directors. The Secretary's report to the Senate Committee on Armed Services noted that, if additional outside review were needed, it would be considered at that time.

Staff Selection

SDIO originally planned to prepare a sponsoring agreement between itself and the new FFRDC that would require the Institute's president and the heads of its technical directorates to be acceptable to the SDIO's Director. The Secretary noted that such approval of key FFRDC personnel is neither new nor unusual and cited the agreement between the Center for Naval Analyses and the U.S. Navy as a precedent.

The Secretary stated that such a role would not adversely affect either the objectivity or the independence of the Institute. He added that to carry out its technical support mission properly, the Institute's personnel must possess the highest professional qualifications and that effective communication and liaison between top management of the two organizations must exist. The approval provisions are meant to ensure this purpose, according to the Secretary.

The Secretary of Defense's Special Assistant for the Institute subsequently clarified DOD's position by noting that the Director of SDIO would require SDIO's concurrence on the selection of the Institute's top level executive—the president—and coordination with the appropriate SDIO peer directors in the selection of key Institute technical personnel. SDIO would exercise veto power over only the Institute's selection of the president. SDIO intends to seek only review and comment authority for other organization officers and senior technical directors of the FFRDC's staff.

Work Plan Approval

SDIO proposes that the Institute submit its work plans every 6 months for SDIO's approval. The Secretary noted that this requirement is reasonable in that it ensures that the FFRDC fulfills its stated purpose, meets the

SDIO's technical needs, and maintains a proper focus on its specific functions without encroachment on the private sector or other organizations.

Provision for Independent or Self-Initiated Work

The Secretary's report to the Senate Committee on Armed Services noted DOD's opposition to committing a fixed percentage of the Institute's budget to the performance of self-initiated work and cited the history of severe cutbacks in requested SDI funding as the basis for his objection. According to the report, DOD is not averse to contract provisions that permit the Institute the flexibility to initiate its own work proposals. The Secretary agreed that the ability to initiate related research and studies is valuable and that DOD would explore the possibility of negotiating contract provisions toward that purpose.

In subsequent remarks, the Secretary's Special Assistant noted that SDIO would support and encourage the Institute to initiate related research and studies that the Institute deems necessary to provide SDIO with objective technical and feasibility data. SDIO would provide funding for the Institute's independent research, but the level of funding would not be determined until future contract negotiations are conducted.

Conflict-Of-Interest and Post-Employment Restrictions

DOD plans to address real or apparent conflicts of interest through SDIO's sponsoring agreement with the SDI Institute. For example, the sponsoring agreement would prohibit any SDI Institute employee, officer, or Board of Trustee member from holding any position with SDIO. The agreement would also prohibit more than one-half of the members of the SDI Institute Board of Trustees from simultaneously holding any position with the SDI Advisory Committee or any similar body which provides technical, scientific, or strategic advice to DOD on SDI. Moreover, in order to avoid any actual or apparent conflict-of-interest, DOD expects that persons who are members of both the SDI Advisory Committee and the SDI Institute Board of Trustees would abstain from participation in any evaluation or advice by the SDI Advisory Committee regarding the SDI Institute. Section 208 (a) of Title 18, United States Code, would bar SDI Advisory Committee members who are also on the SDI Institute Board of Trustees from participating in recommendations directly affecting the new FFRDC's financial interests, in the absence of a waiver under section 208 (b).

The Secretary noted DOD's intent to minimize possible conflicts of interest between the Institute and other organizations. Toward this end, the Institute would not be permitted to have any SDI-related work beyond its specific technical functions, or to serve other clients who have SDI-related work. This restriction is considered necessary because DOD expects that the Institute would provide advice, recommendations, and evaluations to the SDIO that could affect decisions to award federal research and development contracts to other entities. Also, the Institute may undertake research audits of other entities, including other FFRDCs and national laboratories, that are performing research for the SDI program.

DOD intends to require that Institute personnel not hold any positions with other organizations that have financial interest in SDI work. DOD also plans to incorporate appropriate provisions in the sponsoring agreement under which Institute employees would safeguard information owned by other contractors.

According to DOD, it is possible that, in isolated instances and as a temporary measure, individual technical personnel from SDIO may be stationed at the SDI Institute to fill an immediate need, but there is no plan to do so as a regular course. The DOD believes that there would be no apparent conflict-of-interest between the SDIO and SDI Institute as the purpose of one is to meet the technical support needs of the other.

The Institute would not be legally subject to the post-employment restrictions that apply to federal employees. According to the advice of DOD counsel, the Secretary reported that it would not be appropriate to attempt to impose "revolving door" provisions on FFRDC employees because

- DOD could not include "revolving door" provisions that included financial penalties and imprisonment under federal statutes in a contract;
- the type of employment limitations that the FFRDC contractor would need to negotiate with its employees has been found to be of questionable enforceability under general principles of contract law, as well as specific state statutes; and
- provisions limiting future employment are likely to inhibit recruitment of personnel possessing the highest level of relevant experience.

The Institute's involvement would be primarily oriented to evaluating research results, rather than research proposals. Moreover, DOD plans to require the Institute to follow the general practices of submitting financial disclosure statements and agreeing to safeguard proprietary information in any activities that call for reviewing research proposals.

Views of Consultants and Heads of DOD-Sponsored FFRDCs on DOD's Plans

The consultants responded to questions concerning contractor selection, review of proposal(s), and staff selection, while the heads of FFRDCs answered questions about staff selection, work plan approval, provisions for independent or self-initiated work, and conflict-of-interest/post-employment restrictions.

Contractor Selection

Eight of the nine original contracts for the DOD-sponsored FFRDCs were established by sole-source awards. The contract for the Software Engineering Institute, established in 1984, was a competitive award, as was the renegotiated contract in 1983 for the Center for Naval Analyses.

No consensus appeared among consultants on the question of what selection method would least compromise the independence and objectivity of the contractor chosen to provide technical support to SDIO. Three said that competition compromises independence and objectivity more than sole-source selection; four said that competition compromises them much less than the alternative method; and three said that the two selection methods' impacts are the same. The following reasons were provided in support of these responses.

One consultant who said that competition compromises independence more than sole-source selection noted that (1) the best proposal is not always written by the best source and (2) the competitive process would not always ensure the best possible source. Another consultant indicated that sole-source selection will be interpreted by the public as a "put up" job: SDIO did not want any embarrassing questions asked so it selected its people for the FFRDC proposal. Conversely, the consultant believed that DOD did the right thing by not going public for proposals at this point. He indicated that the Institute will have to contract out since it will not have all the needed expertise in-house. The consultant added that SDIO would contract out for the assistance it needs but that SDIO lacks objectivity and is not trusted. SDIO wants the new Institute to project the objectivity it lacks.

Three consultants said that it is unrealistic to expect for-profit firms to submit proposals in anticipation that SDIO might reject the proposal of the group it had invited to set up the Institute.

In contrast, three consultants said that a form of competition already had occurred within SDIO and DOD for the people selected to submit the proposal.

Reviewing Proposals

Nine consultants said that some type of peer review of the proposal(s) is necessary to best guarantee independence and objectivity, while two indicated that a review by SDIO was sufficient. All agreed that SDIO needs to be involved in the review because it is responsible for the SDI program. Beyond this agreement, no consensus emerged among those who voiced a need for a peer review on the organization(s) that should comprise the review group. However, peer review was thought to enhance the credibility of the review process, improve the quality of the proposal(s), and be required because of the political climate over SDI.

The military services and other DOD agencies should be included in the review process because they are heavily involved in SDI, according to three consultants. One consultant stated that participation by organizations heavily involved in the SDI program would help them feel more comfortable about the Institute. Another consultant said that DOD agencies that are involved with FFRDCS, unlike SDIO, have experience with FFRDCS that could benefit SDIO.

Three consultants agreed that non-DOD government agencies could lend insights and credibility to the review process. The consultants suggested such organizations as the Department of Energy, National Bureau of Standards, National Science Foundation, Space Science Board, National Academy of Engineering, Defense Science Board, and National Research Council. One consultant envisions a cross-service, multiagency board under the Secretary of Defense to review the proposal and thinks that non-DOD government agencies should be involved, but not non-governmental bodies. The consultant said that it is always wise to have some redundancy in the process.

One consultant believes that a combination of SDIO, other DOD, and non-DOD agency peer review and non-government institutions or persons would best serve to evaluate the Institute proposal(s). Individuals outside the government—"the best minds in the country"—should be brought in to provide their expert advice.

In contrast, another consultant said that he would not submit the proposal(s) to review by non-government organizations because of the misinformation and deep feelings about the SDI program that exist outside of government. Neither would he submit the proposal(s) for peer review to those DOD organizations involved in the SDI program because of their biases.

Two consultants said that only SDIO should review the proposal(s) for the FFRDC because SDIO is the customer. One does not think that SDIO's review would have any affect on the FFRDC's independence and objectivity. The second consultant stated that SDIO has responsibility and authority for its decisions. According to this consultant, the right group of people on the Board of Trustees is more important to guarantee independence and objectivity than the group that reviews the original proposal.

Staff Selection

Only one of the sponsors of the nine FFRDCs we questioned exercises veto power over staff selection. The Navy, sponsor for the Center for Naval Analyses, exercises veto power over the selection of the president and vice-president.

The 11 consultants were almost evenly split on the question of whether SDIO's veto power over staff selection would compromise the FFRDC's independence and objectivity. Three said that they would find acceptable a staff selection veto power over the FFRDC director; two would accept it to the technical director level; three said that no staff selection veto power at any level would be acceptable; and one favored veto power to some unspecified level. The other two consultants did not express strong views on the acceptability of a veto power.

All nine FFRDC officials said that SDIO's proposed veto power over staff selections would compromise the FFRDC's independence and objectivity. Nevertheless, while no FFRDC official would accept sponsor veto power to the technical directors' level, two would accept it at the director's level.

Consultants and FFRDC officials suggested several reasons for their observations.

Four FFRDC officials and three consultants suggested that consultation was the proper mechanism for selecting top level staff. Because FFRDCs have many motivations against acquiring a person who would be unacceptable to the sponsor, they would not force an unacceptable person on their sponsors. The consultants said that consultation on selection is important and usually occurs.

One consultant believed that the question of veto power over staff selection is "a red herring" because staff selection will be done in consultation with the customer. Thus, to describe the veto power of a FFRDC sponsor as being similar to that of the President of the United States is nonsense. With respect to veto over technical directors, the Board of Trustees will select staff according to qualifications.

A FFRDC official and a consultant said that an informal veto power already exists in the sponsor's control of the salaries of top personnel and input to funding for the FFRDC. This type of intervention is another motivation against selecting a person who would be unacceptable.

Seven heads of FFRDCs said there should be no sponsor veto power over the selection of staff at any level, while two FFRDC officials and three consultants approved of a veto power at the president or director level, but not at the technical director level. In contrast, two consultants believed that a staff selection veto power even at lower levels is necessary to ensure that people compatible with SDIO are selected. Officials of six of these seven FFRDCs said that the choice should be left to the Board of Trustees, which would be aware of the sponsor's views.

One FFRDC director said that any sponsor involvement at all becomes the equivalent of making a choice. If the sponsor suggests a name to the FFRDC, the contractor really has no choice and has given up its power to appoint people. Staff selection veto power, according to another FFRDC official, undercuts all the other reasons for SDIO to establish a FFRDC.

Two consultants, one who supported a veto power and one who said it denigrates an organization, agreed that a good Board of Trustees is more important.

According to a consultant who indicated that veto power for only the top two or three individuals is acceptable, the Department of Energy has the right to exercise a veto over the selections of the top individuals for its laboratories.

One consultant said that the FFRDC's sponsor should have a top man at the FFRDC in whom it has confidence, but the sponsor should not reach down into the senior analyst/engineer level, where the organization's technical talents are.

Of the two consultants who believed that veto power over staff selection is necessary, one said that veto power compromises independence and objectivity, but is essential because the Institute needs to have a management with which SDIO can work. This consultant said that SDIO should have veto power over the top 10 to 15 management people, but should not have input in selecting individuals below that level. The other consultant believed that, based on his experience, SDIO's veto power over staff selection would probably not compromise the FFRDC's independence and objectivity.

The big danger, according to the head of one FFRDC, would be in setting up a FFRDC whose president supported the administration's position, right or wrong, when an independent body is needed. This official's FFRDC has had people from government on its staff, but has never given its sponsor a say in who runs the organization. The trustees, however, deliberate over who can work with the sponsor.

Among the FFRDC officials who indicated that veto power over staff selection would definitely compromise the FFRDC's independence and objectivity, three said that their strength is the diversity of their staffs' viewpoints and that the Institute will need to work harder at maintaining this because its client base will be less diverse.

Work Plan Approval

Five FFRDCs negotiate work plans with their sponsors; three have annual work plans approved by advisory committees after sponsor/FFRDC interaction; and one has 1- and 5-year plans approved by its sponsor.

No consensus emerged among the heads of FFRDCs regarding whether required SDIO approval of the Institute's work plan compromises independence and objectivity more, less, or the same as joint agreement. Two officials indicated that there is no difference between work plan approval and joint agreement, and three indicated that work plan approval compromises independence and objectivity more than joint agreement. Four officials responded that the question did not define "work plans," that use of such terms as "joint agreement" and "approval" did not accurately describe the research plan formulation process, or that they were unable to answer the question.

All FFRDC officials indicated that work plans must be developed by mutual agreement and consultation between the sponsor and FFRDC because the FFRDC must be responsive to the sponsor's needs.

Six officials noted that projects can be initiated by either party. Work plan development is always an interactive process.

Seven officials distinguished between overall work plans and task orders for particular research projects. One FFRDC president noted that the assignment of a research project is not a work plan. This president's FFRDC receives funding and a contract, which has a general scope of work. The FFRDC cannot spend money until it has task orders which tell it what to do, but not how to do it. Six officials noted that sponsors can determine projects to do, but not methodologies or staff assignments.

One FFRDC president noted that what amounts to a veto power over FFRDC work plans is "the greatest danger" to control. If the FFRDC and sponsor work things out together, it is in both parties' interests.

Another FFRDC director said that a work plan is a form of contract; a good contract is based on mutual agreement and trust. This approach maintains independence in the same way that contracts maintain the independent roles of the parties. However, the process must be mutual: it makes no sense to propose something to be done if the FFRDC has no resources to do it or for the FFRDC to propose a project that would use resources if the customer has no need for the product.

The government always has the right to decide not to use a FFRDC when there are disagreements over a work plan, according to one FFRDC head. The FFRDC's funding is generally agreed to at the highest level with respect to overall size, but actual funds are set aside program by program. (This FFRDC has no charter, tenure, or guarantee of a specific level of funding.) If a program office is dissatisfied, it need not set aside funds for work at the FFRDC. Thus, the power to go elsewhere is a form of control, but operationally it is not a direct line of control.

Two officials said that a 6-month review is too frequent, while another said that SDIO might need to review the Institute program monthly because SDI is moving so quickly. Another FFRDC director said that the constantly changing environment of SDI would make such a 6-month review process difficult and that it is better to work together to develop and write mutually agreeable work plans and mutually bring them up the management chain.

Provisions for Independent or Self-Initiated Work

All nine FFRDCs have provisions for independent research[3] under the pertinent procurement regulations, specific agreements in their contracts, and/or negotiated agreements with their sponsors.

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[3] Some FFRDCs prefer to call independent research "self-initiated work" because, by definition, independent research is charged to an organization's overhead account.

Eight of the nine FFRDC officials said that the guarantee of some level of independent research enhances the FFRDCs' independence and objectivity; however, there was no agreement on the level. The other official stated that the independent research provision probably enhances the FFRDC's independence and objectivity.

According to the officials, independent research allows them to do forward planning, to examine longer-term problems, and to explore questions that the sponsors do not think to or do not want to ask.

According to representatives of one FFRDC, a FFRDC always has ideas or proposals to bring to the sponsor that it is not directing the FFRDC to examine. Some provision should be made for initial exploration in those areas or for carrying some other work further than the definitions of the assigned projects. They also said that the need for a "guarantee" depends on the sponsor, as some seek more control than others. Moreover, the term "guarantee" is a strong statement. This FFRDC, for example, operated many years without such an arrangement, but the sponsor gave the organization flexibility. Some small flexibility is required to preserve an organization's independence and objectivity.

These FFRDC officials said that there is no such thing as a "guaranteed" independent research program. The sponsor could reject self-initiated research in a given year and could emphasize this rejection by not providing funds for such work. They added that a formal provision, instead of a guarantee, would enhance the FFRDC's independence.

Another FFRDC representative stated that the amount allocated for independent research should be enough to achieve meaningful results. A small percentage of a few million dollars in a program the size of the Institute might fund only a few staffers and might not be significant. When resources are so small, what occurs is not research, but rather people currently without projects to work on simply charging their time to the "independent research" category.

Conflict-Of-Interest and Post-Employment Restrictions

All nine FFRDCs have conflict-of-interest provisions, but none has post-employment restrictions. All nine of the FFRDC presidents or heads indicated that not having post-employment provisions would compromise the independence and objectivity of a FFRDC serving SDIO to little or no extent. FFRDC directors noted several points.

Four said that "revolving door" provisions are not necessary since FFRDCs have strict conflict-of-interest provisions or policies, such as prohibiting employees from having any relationship with designated companies, restricting staffs from running businesses that the FFRDCs would then have to evaluate, and approving outside work.

Post-employment restrictions, according to officials of three FFRDCs, are not enforceable and/or inhibit FFRDCs from attracting high-quality people. One FFRDC's president had not seen abuse in either direction (from government to FFRDCs or vice versa). In this president's experience, as a matter of human nature, people moving from one office or agency to another adopt the new organization's perspective, as do people leaving government or the military to go to FFRDCs.

Officials of two FFRDCs said that their organizations do not hire government or military people from offices with which the FFRDC works. One official's organization keeps the total number of retired government/military people on its rolls below 20 percent.

Two officials of FFRDCs stated that they do not subcontract work and thus see no potential for conflict. Because these FFRDCs do not contract, there is little chance for individual employees to set up entities that they could operate for their own benefit upon leaving the FFRDC. Contracts are all controlled by the government. Furthermore, as a corporation, the FFRDC does not evaluate proposals to the government. Although government agencies can ask consultants, including the FFRDC, to assist it in the technical evaluation of proposals from any source, the government is completely in charge. One official recommended that the Institute stay out of the bid selection process for SDI contracts.

Consultants and Heads of DOD-Sponsored FFRDCs Contacted During Our Review

Consultants

Dr. D. Allan Bromley — Director, Wright Nuclear Structure Laboratory, Yale University. Consultant to several corporations and national laboratories. Member, White House Science Council, Federal Laboratory Review Panel.

Dr. Ruth M. Davis — President, Pymatuning Group, Incorporated. Served as Deputy Under Secretary of Defense for Research and Engineering. Served as Assistant Secretary for Resource Applications, Department of Energy.

Mr. Richard DeLauer — President, The Orion Group, Ltd. and member of the Board of Directors, TRE Corporation. Served as Under Secretary of Defense for Research and Engineering. Served as Executive Vice-President and a member of the Board of Directors, TRW, Incorporated.

Dr. John M. Deutch — Provost, Massachusetts Institute of Technology. Served as a member of the Defense Science Board and on the Army Science Advisory Panel. Served as Under Secretary, Office of Energy Research, Department of Energy.

Dr. Alexander H. Flax — Home Secretary, National Academy of Engineering. Served as a member of the Defense Science Board. Served as Chief Scientist and Assistant Secretary for Research and Development, Department of the Air Force. Served as Vice-President and Technical Director, Cornell Aeronautics Laboratory. Served as President, Institute for Defense Analyses.

Dr. Ivan A. Getting — Consultant. Served as President and Trustee, The Aerospace Corporation. Served as the Vice-President for Engineering and Research, Raytheon Corporation.

Dr. Marvin L. Goldberger — President, California Institute of Technology. Served as a member of the President's Science Advisory Committee. Served as Chairman, Federation of American Scientists.

Dr. Arthur K. Kerman — Director, Laboratory for Nuclear Science, Massachusetts Institute of Technology. Consultant to several national laboratories. Served as a member of the President's Science and Academic Advisory Committee for Livermore and Los Alamos National Laboratories. Member, White House Science Council, Federal Laboratory Review Panel.

General Brent Scowcroft — Consultant with International Six, Incorporated. Retired Air Force General. Served as Special Assistant to Director, Joint Staff, Joint Chiefs of Staff. Served as Assistant to President, National Security Affairs.

Mr. Barry Shillito — Consultant. Served as Chairman, Trade Management International, Ltd. Served as Assistant Secretary of Defense for Installations and Logistics.

Major General Robert Trimble — Vice President with Martin Marietta Corporation. Retired Air Force General. Served as Assistant Deputy Under Secretary of Defense for Research and Engineering (Acquisition) and Acting Deputy Under Secretary of Defense for Acquisition Management.

Heads of DOD-Sponsored FFRDCs

Dr. Eberhardt Rechtin, President, The Aerospace Corporation

Dr. Phillip DePoy, President, Center for Naval Analyses

General William Y. Smith, President, Institute for Defense Analyses

Mr. Perkins C. Pedrick, President, Logistics Management Institute

Dr. Stephen Drezner, Vice-President, Rand-Arroyo Center

Mr. Michael Rich, Vice-President, Rand-National Defense Research Institute

Dr. James A. Thomson, Vice-President, Rand-Project Air Force

Dr. Angel Jordan, Acting Director, Software Engineering Institute and Provost, Carnegie Mellon University

Mr. Charles A. Zraket, President, The MITRE Corporation[1]

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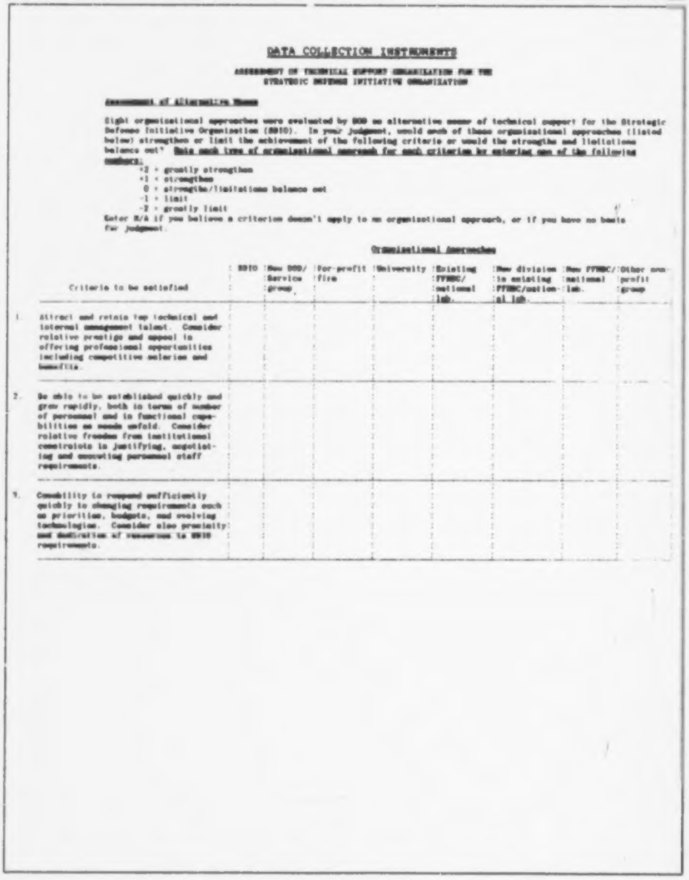
[1] We also met with Dr. Norman Waks, Chief Management Scientist, The MITRE Corporation.

Data Collection Instruments Completed by Consultants and Heads of DOD-Sponsored FFRDCs



DATA COLLECTION INSTRUMENTS

ASSESSMENT OF TECHNICAL SUPPORT ORGANIZATION FOR THE
STRATEGIC DEFENSE INITIATIVE ORGANIZATION

Assessment of Alternative Means

Eight organizational approaches were evaluated by DOD as alternative means of technical support for the Strategic Defense Initiative Organization (SDIO). In your judgment, would each of these organizational approaches (listed below) strengthen or limit the achievement of the following criteria or would the strengths and limitations balance out? Rate each type of organizational approach for each criterion by entering one of the following numbers:

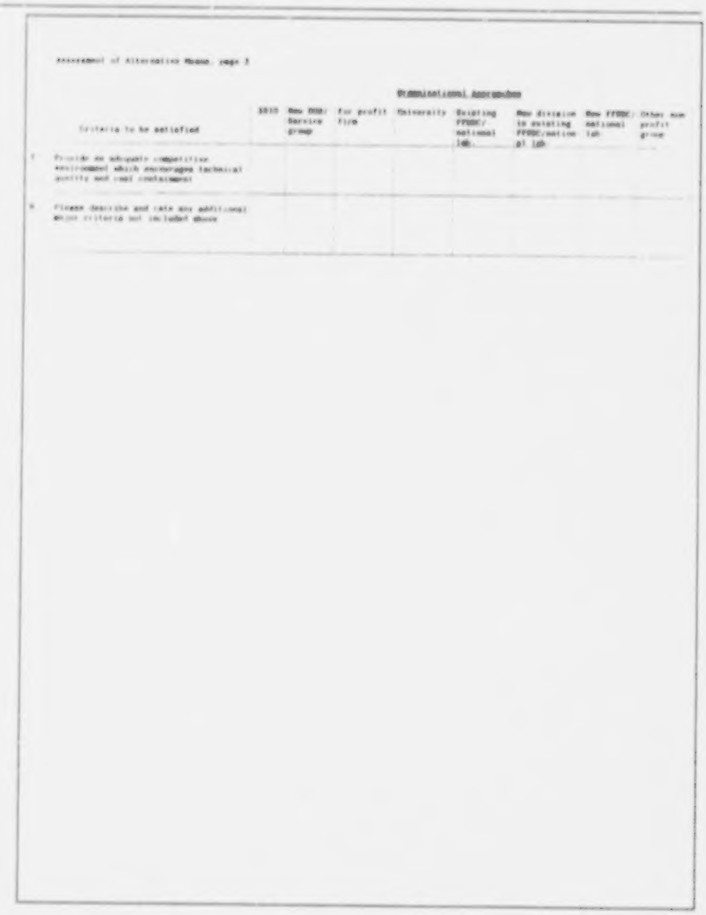
+2 = greatly strengthen
+1 = strengthen
0 = strengths/limitations balance out
-1 = limit
-2 = greatly limit

Enter N/A if you believe a criterion doesn't apply to an organizational approach, or if you have no basis for judgment.

		Organizational Approaches							
	Criteria to be satisfied	SDIO	New DOD/ Service group	For-profit firm	University	Existing FFRDC/ national lab.	New division in existing FFRDC/national lab.	New FFRDC/ national lab.	Other non-profit group
1.	Attract and retain top technical and internal management talent. Consider relative prestige and appeal in offering professional opportunities including competitive salaries and benefits.								
2.	Be able to be established quickly and grow rapidly, both in terms of number of personnel and in functional capabilities as needs unfold. Consider relative freedom from institutional constraints in justifying, negotiating and executing personnel staff requirements.								
3.	Capability to respond sufficiently quickly to changing requirements such as priorities, budgets, and evolving technologies. Consider also proximity and dedication of resources to SDIO requirements.								

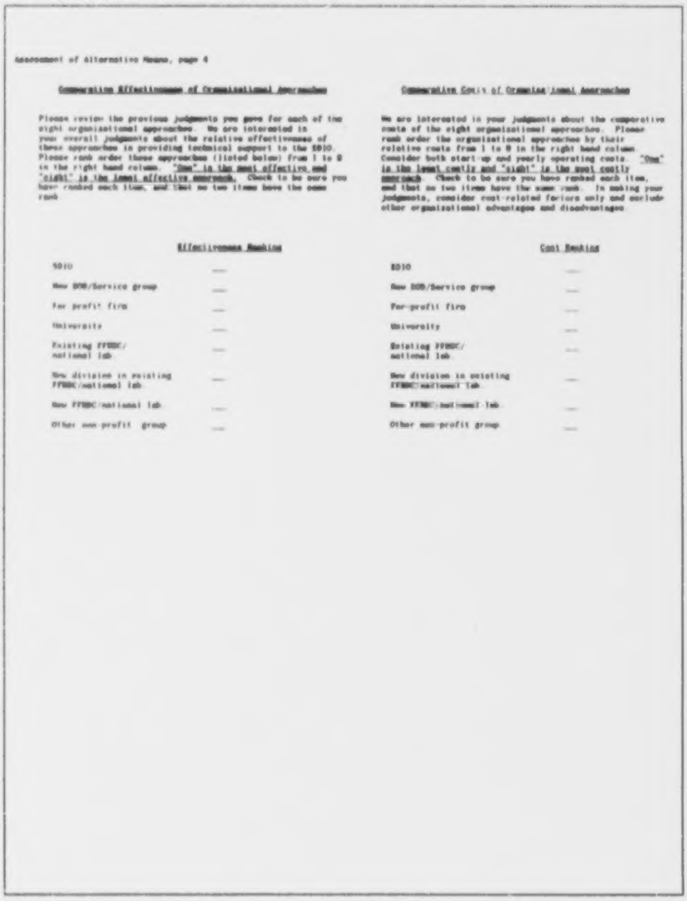
Assessment of Alternative Means, page 2

Criteria to be satisfied	Organizational Approaches							
	SDIO	New DoD/ Service group	For-profit firm	University	Existing FFRDC/ national lab.	New division in existing FFRDC/national lab.	New FFRDC/ national lab	Other non-profit group
4. Provide independent and objective advice based on a knowledgeable evaluation of all existing information, including sensitive government and industrial data. Consider relative freedom from other institutional loyalties (Service/corporate affiliations); relative freedom from real or apparent conflicts of interest in handling industry proprietary data and ability to safeguard national security information. Full disclosure of affairs as may be legally required. Intellectual independence in recommending controversial actions and strategies to SDIO.								
5. Possess technical and functional capabilities needed to perform, analyze, integrate, and support the basic and applied research of the SDIO. Must maintain close, continuous interactions with SDIO in performing technical program planning and in providing general systems engineering oversight on very large systems.								
6. Restrict itself to this technical support role for the SDIO in order to avoid any actual or apparent conflicts of interest with its defined role.								



Assessment of Alternative Means, page 3

		Organizational Approaches							
	Criteria to be satisfied	SDIO	New DOD/ Service group	For profit firm	University	Existing FFRDC/ national lab.	New division in existing FFRDC/nation al lab	New FFRDC/ national lab	Other non profit group
7	Provide an adequate competitive environment which encourages technical quality and cost containment								
8	Please describe and rate any additional major criteria not included above								



Assessment of Alternative Means, page 4

Comparative Effectiveness of Organizational Approaches

Please review the previous judgments you gave for each of the eight organizational approaches. We are interested in your overall judgments about the relative effectiveness of these approaches in providing technical support to the SDIO. Please rank order these approaches (listed below) from 1 to 8 in the right hand column. "One" is the most effective and "eight" is the least effective approach. Check to be sure you have ranked each item, and that no two items have the same rank.

Effectiveness Ranking

SDIO ____

New DOD/Service group ____

For profit firm ____

University ____

Existing FFRDC/ national lab ____

New division in existing FFRDC/national lab ____

New FFRDC/national lab ____

Other non-profit group ____

Comparative Costs of Organizational Approaches

We are interested in your judgments about the comparative costs of the eight organizational approaches. Please rank order the organizational approaches by their relative costs from 1 to 8 in the right hand column. Consider both start-up and yearly operating costs. "One" is the least costly and "eight" is the most costly approach. Check to be sure you have ranked each item, and that no two items have the same rank. In making your judgments, consider cost-related factors only and exclude other organizational advantages and disadvantages.

Cost Ranking

SDIO ____

New DOD/Service group ____

For-profit firm ____

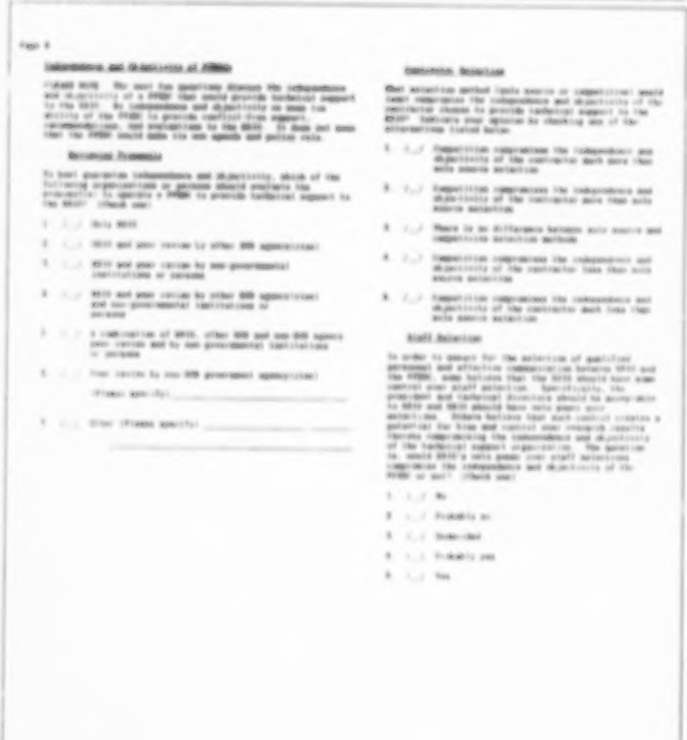
University ____

Existing FFRDC/ national lab ____

New division in existing FFRDC/national lab ____

New FFRDC/national lab ____

Other non-profit group ____



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Independence and Objectivity of FFRDCs

PLEASE NOTE: The next few questions discuss the independence and objectivity of a FFRDC that would provide technical support to the SDIO. By independence and objectivity we mean the ability of the FFRDC to provide conflict-free support, recommendations, and evaluations to the SDIO. It does not mean that the FFRDC would make its own agenda and policy role.

Oversight Framework

To best guarantee independence and objectivity, which of the following organizations or persons should evaluate the proposal(s) to operate a FFRDC to provide technical support to the SDIO? (Check one)

1. ☐ Only SDIO
2. ☐ SDIO and peer review by other DOD agency(ies)
3. ☐ SDIO and peer review by non-governmental institutions or persons
4. ☐ SDIO and peer review by other DOD agency(ies) and non-governmental institutions or persons
5. ☐ A combination of SDIO, other DOD and non-DOD agency peer review and by non-governmental institutions or persons
6. ☐ Peer review by non-DOD government agency(ies)
(Please specify) ______________________
7. ☐ Other (Please specify) ______________________
____

Contractor Selection

What selection method (sole source or competitive) would least compromise the independence and objectivity of the contractor chosen to provide technical support to the SDIO? Indicate your opinion by checking one of the alternatives listed below.

1. ☐ Competition compromises the independence and objectivity of the contractor much more than sole source selection
2. ☐ Competition compromises the independence and objectivity of the contractor more than sole source selection
3. ☐ There is no difference between sole source and competitive selection methods
4. ☐ Competition compromises the independence and objectivity of the contractor less than sole source selection
5. ☐ Competition compromises the independence and objectivity of the contractor much less than sole source selection

Staff Selection

In order to account for the selection of qualified personnel and effective communication between SDIO and the FFRDC, some believe that the SDIO should have some control over staff selection. Specifically, the president and technical directors should be acceptable to SDIO and SDIO should have veto power over selections. Others believe that such control creates a potential for bias and control over research results thereby compromising the independence and objectivity of the technical support organization. The question is: would SDIO's veto power over staff selections compromise the independence and objectivity of the FFRDC or not? (Check one)

1. ☐ No
2. ☐ Probably no
3. ☐ Undecided
4. ☐ Probably yes
5. ☐ Yes

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COMPLETED BY HEADS OF DOD-SPONSORED FFRDCs

Independence and Objectivity of FFRDCs

PLEASE NOTE: The following questions discuss the independence and objectivity of a FFRDC that would provide technical support to the SDIO. By independence and objectivity we mean the ability of the FFRDC to provide conflict-free support, recommendations, and evaluations to the SDIO. It does not mean that the FFRDC would make its own agenda and policy role.

Conflict of Interest and Post Employment Restrictions

To minimize the possibility of conflicts of interest certain restrictions may be placed on both a new FFRDC and on its employees. For example, the organization may not be permitted to engage in any other SDI related work beyond its specific technical functions nor to serve other clients who themselves have SDI or SDI-related work. Personnel with a new FFRDC may not be permitted during their tenure with the organization to hold any position with any other organization that has financial interest in SDI work and the sponsoring agreement would require employees to safeguard information owned by other contractors. Also, if any directors of a new FFRDC providing technical support to the SDIO are members of the SDI Advisory Council (SDIAC), they must recuse themselves from participation in any evaluation or advice to the SDIO regarding the new FFRDC. If it arises that personnel must review proposals submitted by private concerns, the concerned personnel would be required to submit financial disclosure statements and agreement to safeguard proprietary information.

In some situations, post employment restrictions may also be required, that is, employees are subject to "revolving door" provisions intended to protect the government from conflict of interest. To what extent, if at all, would the lack of post employment provisions compromise the independence and objectivity of an FFRDC serving the SDIO? (Check one)

1. /__/ Compromises the FFRDC to little or no extent
2. /__/ Compromises the FFRDC to some extent
3. /__/ Compromises the FFRDC to a moderate extent
4. /__/ Compromises the FFRDC to a great extent
5. /__/ Compromises the FFRDC to a very great extent

Work Plans

Some feel that SDIO's technical needs would be best served if SDIO had the authority to approve the work plans of the proposed FFRDC every six months. Others disagree on the grounds that this procedure might compromise the independence and objectivity of the FFRDC. They believe that jointly agreed upon work plans would best ensure responsiveness to SDIO and preserve the independence and objectivity of the FFRDC. Indicate your opinion by checking one of the alternatives listed below.

1. /__/ Work plan approval compromises independence and objectivity much less than joint agreement
2. /__/ Work plan approval compromises independence and objectivity less than joint agreement
3. /__/ There is no difference between work plan approval and joint agreement with regard to independence and objectivity
4. /__/ Work plan approval compromises independence and objectivity more than joint agreement
5. /__/ Work plan approval compromises independence and objectivity much more than joint agreement

Staff Selection

In order to ensure for the selection of qualified personnel and effective communication between SDIO and the FFRDC, some believe that the SDIO should have some control over staff selection. Specifically, the president and technical directors should be acceptable to SDIO and SDIO should have veto power over selections. Others believe that such control creates a potential for bias and control over research results thereby compromising the independence and objectivity of the technical support organization. The question is, would SDIO's veto power over staff selections compromise the independence and objectivity of the FFRDC or not? (Check one)

1. ☐ No
2. ☐ Probably no
3. ☐ Undecided
4. ☐ Probably yes
5. ☐ Yes

Provisions for Independent Research

All FFRDCs have some money for independent research. The purpose of this money is to encourage innovation and provide a means to resolve conflicts over conclusions. For some FFRDCs this money is guaranteed and for some it is not. The question is, does the guarantee of some level of independent research money enhance the independence and objectivity of the FFRDC or not? (Check one)

1. ☐ No
2. ☐ Probably no
3. ☐ Undecided
4. ☐ Probably yes
5. ☐ Yes